Deloitte.

Data governance and management practices – MAS information paper

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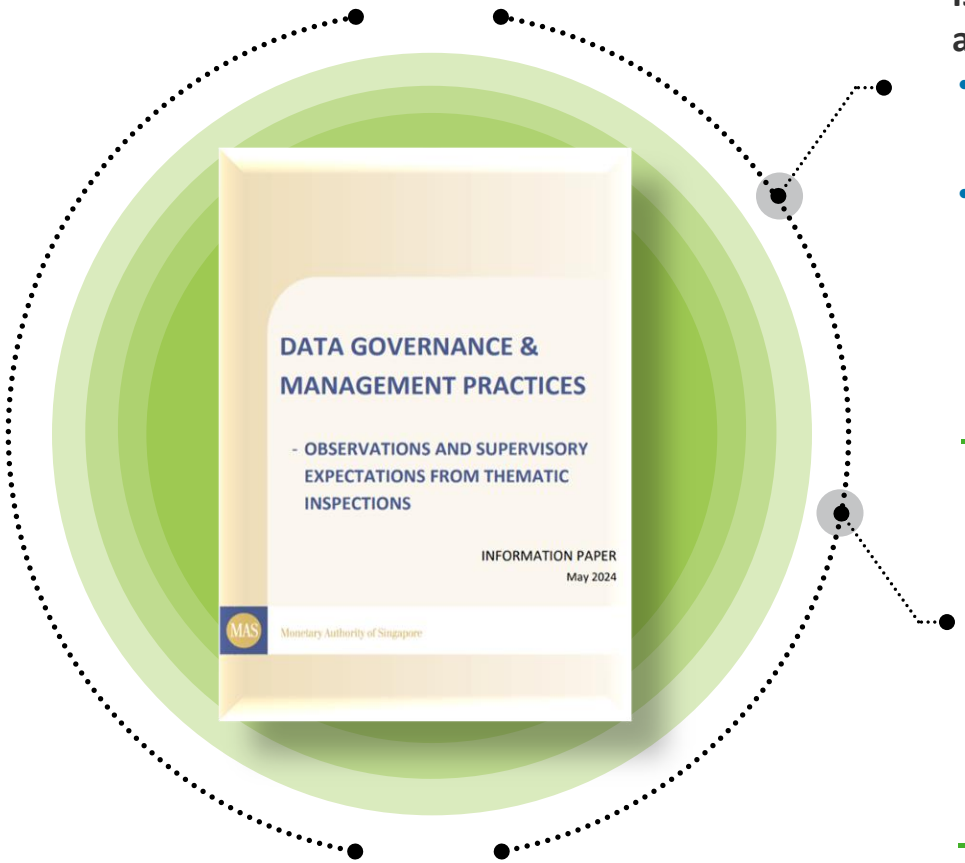
01 | Summary

Introduction and objective



Issuance/Effective date and applicability

- Issuance/Effective date: 29 May 2024
- Applicability: **Banks and Finance Companies** (collectively referred to in this deck as "**FI**" (financial institutions))

Objective

- Set out MAS' supervisory expectations on **data governance and management practices**

4 pillars for effective data governance and management

Board and senior management (BSM) oversight on data management

BSM must oversee processes for achieving effective risk data aggregation and reporting.

Data management organisation

Central data management office (DMO) is responsible for data governance framework and policies, and data management processes.

Data quality management and controls

FIs should measure and monitor the quality of their data and data controls should be supported by a well-organised IT infrastructure and data architecture.

Data issues identification and escalation

FIs should have an established data quality management framework and processes to provide assurance that data is of acceptable quality and fit-for-purpose, throughout the entire data lifecycle.

02 Board and Senior Management (BSM)

Board and senior management (BSM)

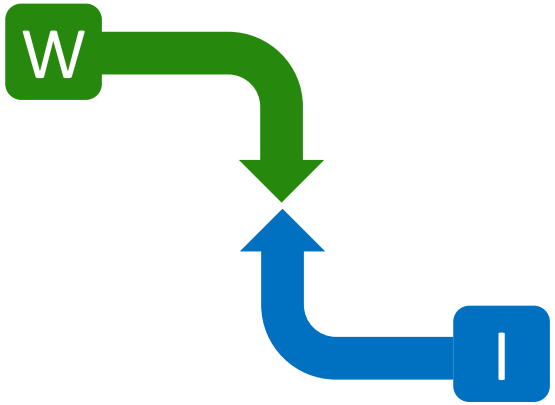
Governance framework and BSM oversight

Supervisory expectations

- Banks should put in place a **robust data governance framework**.
- BSM should exercise **sufficient oversight** over the processes needed to achieve effective risk data aggregation and reporting.
- **Identification, assessment and management of data quality risks** should be an important part of a FI 's overall risk management framework.

Areas done well

- Some FIs established **relevant management committees** for the oversight of data risk, covering data management areas and various regulatory initiatives on data.
- Some FIs also established separate management forums on data and technology that focus on **utilising data as a resource to drive business value**.



Areas for improvement

- **Insufficient updates:** Updates to the BSM often varied in terms of coverage and did not include issues relating to data management and data quality, particularly those that can impact on publicly disclosed and key financial and risk metrics for decision-making purposes.
- **Tracking of BCBS 239:** Some FIs tracked the implementation status only on an ad hoc basis, or not at all. FIs should ensure regular tracking of implementation status of BCBS 239.

Board and senior management (BSM)

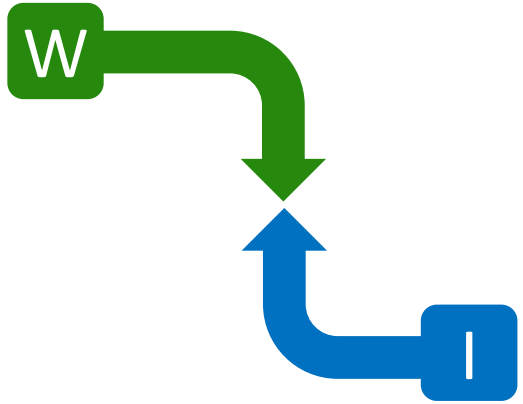
Reporting of data governance metrics

Supervisory expectations

- Senior management should be provided with **relevant, accurate and complete information in a timely manner**.
- There should be an **analysis of data risk** that spotlights systemic and material issues on data quality.
- FIs should **regularly update their Boards** on pertinent data management areas, such as:
  - Data quality and issues of systematic and material impact on financial and risk reporting.
  - Functioning of the data governance framework.
  - Progress of BCBS 239 implementation (for D-SIBs and branches/subsidiaries of G-SIBs).

Areas done well

- **Regular tracking of data management issues**, such as expired end-user computing tools and material data quality issues.
- Incorporating **relevant metrics** into the management reports on data, such as
  a) data risk indicators
  b) data quality, e.g. trend of data quality risk score
  c) outstanding material data issues over period of review
  d) policy compliance and deviation
  e) data culture, e.g. on training and talent development



Areas for improvement

- **Granularity of reporting:** Results of data quality checks were reported at the overall FI -wide level with no further breakdown by business unit (BU)/support unit (SU).
- **Lack of analysis** performed on the data quality trends, including overall data quality trend, common root causes and risk implications.
- **No regular tracking** of data management issues.

03 Data management organisation

Data management organisation

Clear roles and responsibilities

Supervisory expectations

- FIs should put in place sufficient measures and ensure **clarity of roles within the data management operating model** to oversee proper implementation of their data management framework and standards across the organisation, as well as to ensure effective monitoring of data quality.
- FIs should **provide the DMO with a clear mandate** to perform the measurement and monitoring of data quality, including tracking and following up on data quality issues and exceptions/deviations from data management standards.

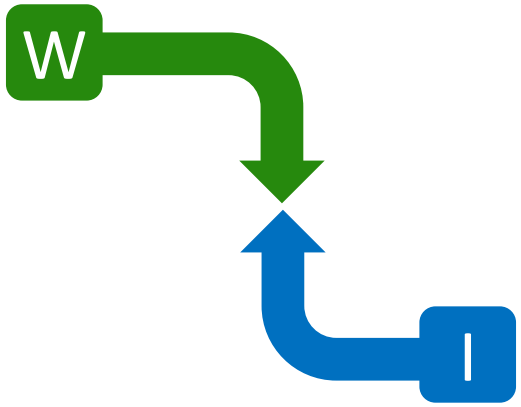
Areas done well

DMOs have clear mandates to be responsible for the following:-

(a) Rectification of exceptions in metadata,

(b) Implementation of relevant data controls as agreed between different data stakeholders; and

(c) Establishment of appropriate data quality thresholds and control assessment.



Areas for improvement

- **Inadequate follow-up** of long outstanding exceptions.
- **Inadequate conduct** of data quality checks.

Data management organisation

Group level coordination (for foreign-incorporated banks)

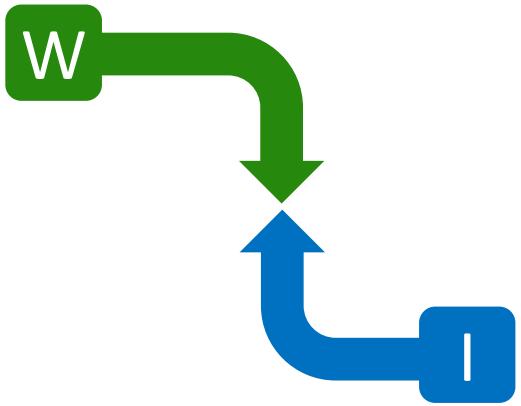
Supervisory expectations

- **Coordination of data management policy** implementation and control processes across entities operating in different jurisdictions by DMOs of foreign D-SIBs.
- There should be **clarity of roles between the DMO at group level and local functions** to implement data controls.

Areas done well

Some FIs implemented practices like

- **Data tracing** to verify end-to-end implementation of data controls across the different systems, including global systems that local operations relied on.
- Group DMOs provided **regular attestations** to reporting units across different jurisdictions with **periodic validation** to ensure that they were made by the appropriate authority, supported by proper checks and in line with validation outcomes.
- Establishment of a **data management charter** detailing the specific roles and responsibilities between Group DMO and the local first line business/support functions.



Areas for improvement

- **Lack of formalised roles and responsibilities** for different data stakeholders.

For foreign D-SIBs operating in Singapore, the **DMO at group level** is responsible for **coordinating data management policy** implementation and control processes **across entities** operating in different jurisdictions.

04 Data quality management and controls

Data quality management and controls

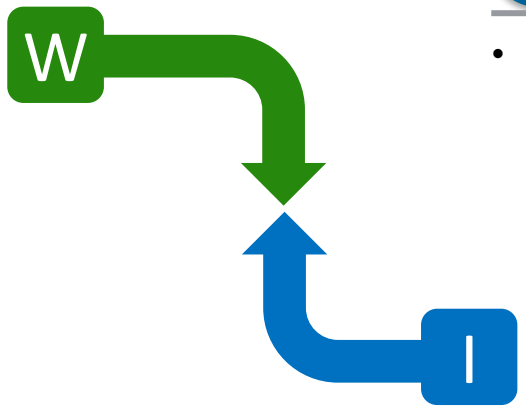
Data quality controls

Supervisory expectations

- FIs should have an **established data quality management framework** and processes to provide assurance that data is of acceptable quality and fit-for-purpose, throughout the entire data lifecycle.
- FIs should put in place **mechanisms to ensure effective implementation** of controls along the data flow, to ensure quality of data for reporting and other applications.

Areas done well

- Establishing **data quality frameworks** that encompass data quality dimensions, types of preventive controls, validation checks and detective controls on data output.
- A few FIs implemented **programmes to strengthen data risk and control awareness** across different data stakeholders like
  - Data governance training modules,
  - Implementing data protection by design in system developing processes; and
  - Setting out clear metrics depicting specific responsibilities for different data roles.
- Some FIs ensured **proper implementation of data quality controls** via
  - Detailed documentation covering controls in reporting process and system controls,
  - Data service level agreements; and
  - Leveraging on RCSA.



Areas for improvement

- **Ensuring proper implementation of data quality controls:** Risk Control Self-Assessment (RCSA) did not include data quality controls in all stages of data flow.

Data quality management and controls

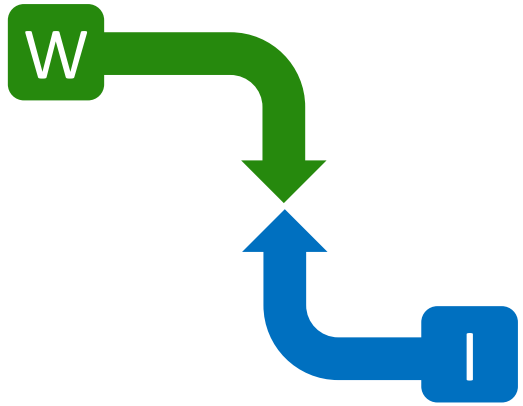
Data quality scorecard

Supervisory expectations

- FIs should establish **data quality indicators or scorecards** with appropriate thresholds to enable systematic measurement and monitoring of quality of data across relevant data quality dimensions.

Areas done well

- Most FIs did **ensure quality in metadata** via
  - Automated validation checks on data quality dimensions to ensure proper input of metadata.
  - Spelling out specific metadata that different data stakeholders need to own and maintain.
  - Formalised data service level agreements to document and approve the updating of metadata.
- Most FIs have data quality scorecards that **measure quality across various dimensions** (e.g. accuracy, validity, consistency) at different levels.
- There are further **processes to analyse scores**, identify data elements below the threshold and remediate associated data issues should be included.



Areas for improvement

- **Determining data quality thresholds:** Setting a common threshold level for all data sets, which may not reflect each data set's unique characteristics.
- **Threshold management oversight:** BU/SUs set thresholds that deviated from the baseline but did not determine materiality triggers for the thresholds to be subject to further review.
- **Inconsistent understanding of data quality:** Different BU/SUs might use different data profiling and quality scorecards, failing to produce a consolidated view.

Data quality management and controls

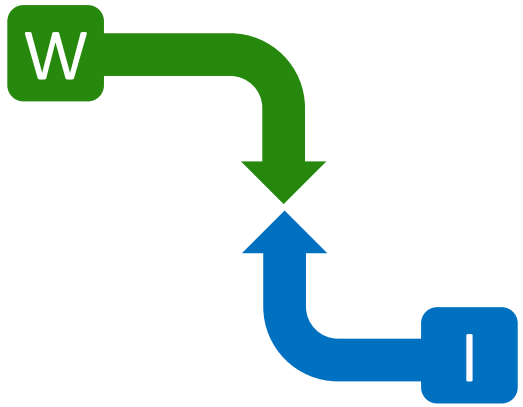
End-User Computing (EUC)

Supervisory expectations

- Data quality management framework should include **standards and controls** to ensure quality of data and output generated from EUCs, with sufficient assurance testing and management reporting.

Areas done well

- Effective processes in place to **risk-rate EUCs** based on their business operations and potential risks.
- Plans for high-risk EUCs, including **options to decommission**, transition to business service applications, or retain with adequate controls.
- **Specific risk assessments** are conducted, subject to review and challenge by second line of defence (2LoD).
- **Check and controls** for EUC management are clearly defined and reviewed prior to sign-off.
- **Regular reporting** at country-level forums on EUCs, including policy updates, burndown analytics and trends in high-risk EUC management, ensuring oversight and management.



Areas for improvement

- **Insufficient risk assessments of EUCs:** Criteria adopted might not be sufficiently comprehensive.
- **Usage of high risk EUCs beyond the approved date** of decommissioning or retirement.
- **Ineffective attestation process** during periodic reviews of EUC inventory by EUC owners.
- **Lack of regular reporting** on EUCs at a country-level forum.

05 | Data issues identification and escalation

Data issues identification and escalation

Escalation of data issues

Supervisory expectations

- FIs should measure and monitor the quality of their data. There should be **appropriate escalation criteria and action plans** to rectify poor data quality and underlying gaps.
- Management should receive **adequate information on material data quality issues**, trend analysis, and progress of remediation measures. For overseas-headquartered banks, local management in Singapore should provide this oversight for the data used in the Singapore operations.

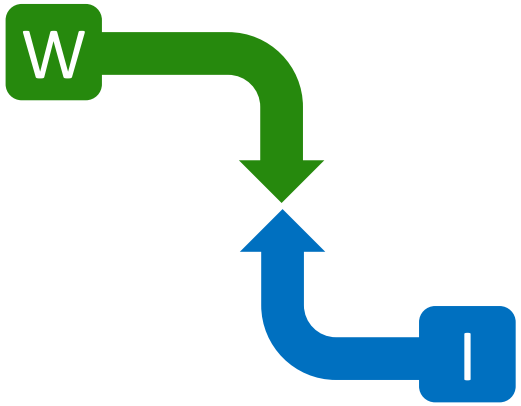
Areas done well

Some FIs are starting to implement better system support for prioritising and remediating data issues at scale, with features like

a) Centralisation of data issues within a single repository, with ability to capture material issues at local, regional and group levels.

b) Provision of visualisation/reporting on volumes, aging, categories, and trending to enhance the remediation of data issues.

c) System logging of data issues by respective data owners and consumers, with notification to trigger root cause analysis, risk rating and remediation measures.



Areas for improvement

- **Severity rating was not assigned** to data issues.
- **No escalation criteria** was established for management reporting and/or prioritisation of remediation.
- Guidance on assignment of severity rating of data issues not formalised into a policy requirement leading to **insufficient attention on prioritising data issues for remediation**.
- **Aging of data issues and trends not reported** at data management forum.
- **Irregular conducting of root cause analysis** on data issues for remediation.

Data issues identification and escalation

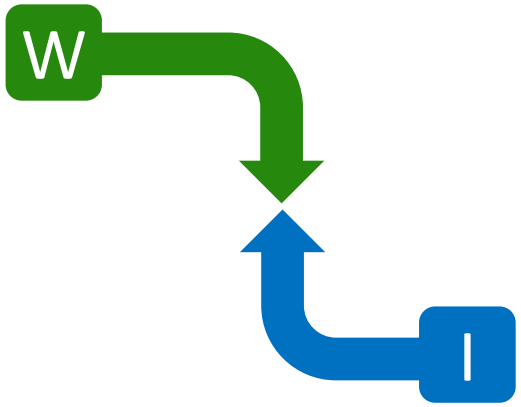
Data lineage

Supervisory expectations

- FIs should have **robust and complete data lineage** for critical data elements (CDEs), as part of their capabilities to identify and rectify data issues and defects.

Areas done well

- A handful of banks captured **full end-to-end data lineage** for CDEs with sufficient granularity (including transformation logic and data control rules) and coverage (including EUCs and manual processes).
- **In one FI, it was a policy requirement to log underlying gaps** that led to a data quality issue in a separate operational risk system for further investigation if the gap is deemed to be sever and could have systematic risk implications.
    - Both data quality issue and underlying gap will be rated in terms of severity, tracked and reported on their remediation status.



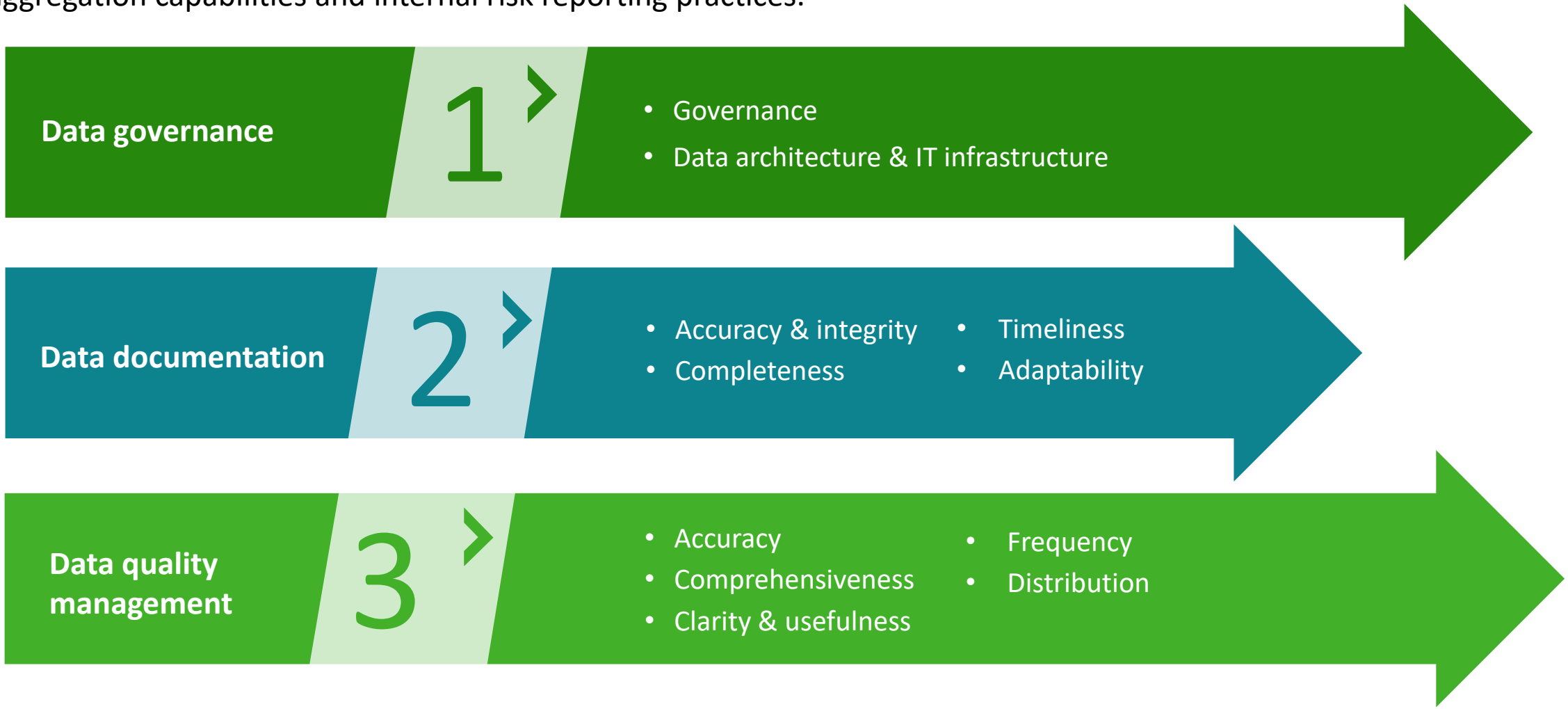
Areas for improvement

- **Uneven standard** of data lineage across the FIs
    - Some Fis only maintained data flow diagrams and incomplete data lineage.

06 Observations relating to BCBS 239

BCBS 239 principles

BCBS 239 presents a set of principles aimed at strengthening FIs' governance frameworks, enterprise-wide risk data aggregation capabilities and internal risk reporting practices.

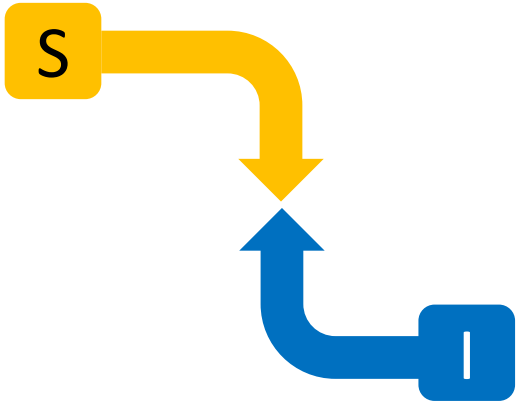


Observations relating to BCBS 239

The observations relating to BCBS 239 principles are relevant for D-SIBs and branches/subsidiaries of Global Systemically Important FIs (G-SIBs) that are operating in Singapore.

Supervisory expectations

- FIs should seek to expand the range of in-scope reports beyond those expected under BCBS 239 e.g. critical functions and data domains.
- FIs should ensure the effective independence of independent validation (IV) functions.
- FIs' risk data aggregation capabilities and risk reporting practices should be subject to an appropriately high standard of validation.



Areas for improvement

- Conflict of interest in IV function reporting
- Lack of formal approval on annual IV plan
- Unclear timeline in IV plan to complete validation of all in-scope reports
- Lack of confirmation on remediation of gaps identified
- Lack of regular drills to test the capability to generate ad hoc reports

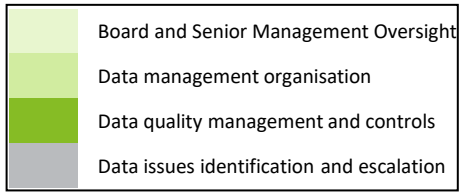
07 Key challenges and recommended solution approach

Key challenges

Key challenges	
01	**Lack of local oversight on data governance**; data ownership and accountability not clearly defined
02	**No enterprise view** of data throughout its lifecycle and no cataloguing of metadata
03	**Limited documentation** of data flow and data controls resulting in inadequate validation of data quality across systems
04	Difficulty determining **reporting structure of DMO and roles and responsibilities** vis a vis IT and other BUs
05	**Data quality thresholds** not customised at entity level and not sufficiently granular to differentiate the importance of data fields
06	**Lack of appropriate risk assessment criteria** for assessing End User Computing risks
07	**Siloed reactive approach** towards identifying and resolving data issues; resolved on ad-hoc basis
08	**Lack of tools** to enable cataloguing of metadata and business glossary, data lineage, centralised view of data access and data quality checks for data elements.

Key business impact

- Risk of **poor management decisions, privacy and confidentiality breaches** due to reliance on inaccurate data
- Data issues remain within systems and resolved upon escalation with some **time constraint to meet regulatory requirements** or business needs
- **Data is not monetized in creating value for business** resulting from lack of alignment between IT who serves data and business users who leverage data as information
- **Limited ability to track data issues** for remediation due to unavailable end-to-end data flow view
- **Delayed response to Regulators'** queries may lead to fines and/or reputational risk
- **Lengthy process** in preparing data for some regulatory reporting and business purpose



Recommended solution approach

Board and Senior Management oversight

- Identify/Establish local Management Committee to oversee data risk
- Develop Data Governance Framework (if not available at HO)
- Update TOR of Committee to include oversight of data
- Develop template for reporting of pertinent data metrics, analysis of data risk, data quality issues etc. (where possible leverage HO reporting template) to Committee
- Establish reporting and escalation framework to local Management/Committee including, but not limited to, material data quality issues

Data management organisation

- Establish local DMO including roles and responsibilities and reporting structure (depending on responsibilities of Group DMO)
- Establish data management charter to clearly detail roles and responsibilities between Group DMO and local functions
- Establish process for performing periodic validation of data in systems (not covered by HO)

Data quality management and controls

- Develop CDE identification rules and list of CDEs
- Define data taxonomy, and framework and processes for metadata management and lineage discovery
- Develop data flow diagrams and map data lineage for CDEs (including EUCs and manual processes)
- Identify and document data lineage, flow and controls across systems (including control owners)
- Establish data quality indicators or scorecards, thresholds and materiality triggers.
- Develop local Data Quality Framework to include management of data quality thresholds, key data controls and validation checks
- Develop Risk Assessment Framework for assessing End User Computing (“EUC”) risks and approach for managing high risk EUCs
- Establish template and local functions responsible for performing Risk Control Self Assessment

Data issues identification and escalation

- Develop framework for identification, monitoring and reporting of data issues
- Develop template for monitoring and reporting of data issues, action plans, root cause analysis and trends
- Identify local function responsible for centralisation and monitoring of data issues till fully remediated

Data management policy (Optional)

- Develop local Data Management Policy with key areas covered (reference to be made to HO policy):-
  - Data Governance
  - Data Management
  - Data Quality Management
  - Data Security and Protection
  - Data Architecture
  - Data Taxonomy
  - Metadata, Master data and Reference data management.

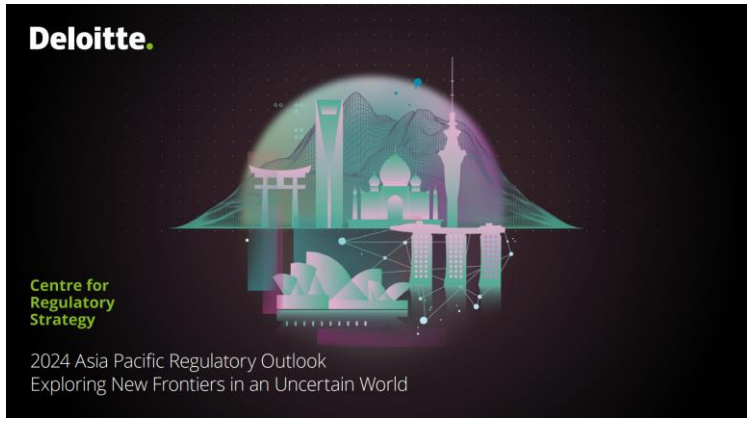
Where relevant, references will be made to BCBS 239 Principles for effective risk data aggregation and risk reporting

Training and communication

- Develop communication plan for stakeholder engagement and training

08 Deloitte Thought Leadership and Case Studies

Deloitte Thought Leadership



As the Asia Pacific region moves forward in 2024, it must remain vigilant in addressing both the opportunities and risks present in its path to ensure recovery and stability in the financial sector over the long term. This requires proactive risk management, adaptability to changing circumstances, and a keen focus on technological advancements while ensuring compliance with both regulatory standards and community standards.

2024 banking and capital markets outlook

Reporting strategy that drives the business forward

Data and analytics
Riding the digitalisation wave

Quality assurance program for data reporting

Data governance for next-generation platforms

Data Risk and Governance
Is your business data reliable?

Our Credentials| Where have we done this before?

Large foreign bank– Data Governance Framework Implementation

Background

Assisted to develop a data governance framework, including creating policies for data inventory, quality, loss prevention, privacy, and information asset management. This involved conducting a gap assessment and designing improvements to ensure robust data governance across the organization.

Value Provided:

- Established clear senior management oversight and defined roles for key stakeholders, enhancing accountability.
- Standardized data processes across the organization, improving consistency, efficiency, and reducing errors.
- Enhanced data quality visibility for key stakeholders, leading to better decision-making.
- Optimized daily operations through automated checks, ongoing data quality monitoring, and effective issue remediation.

Large bank - Data Management and Big Data Analytics

Background

Assisted to review data governance maturity and modernisation of their data lake platform to enhance data management capabilities.

Value Provided:

- Enhanced policies and guidelines for sustainable practices was rolled out group-wide.
- Established a secured Data Lake platform to enable the bank to monetize data effectively and automate backend data integration.
- Established the Single Customer View to provide a unified "single source of truth," empowering users with self-service data analysis and comprehensive customer insights.
- Developed Behavioral Scoring to improve credit decision-making, reduce default rates, optimize collection strategies, and enable targeted marketing campaigns.

Large Banking Group - Data Management and Analytics Platform Implementation

Background

Assisted to design and implement end-to-end data management, data governance, Bank Negara Malaysia regulatory reporting and analytics platform solution

Value Provided:

- Allowed Management to have access to timely performance information
- Streamlined the Bank's reporting process
- Strengthened the Bank's Data Governance practice
- Increased the Bank's analytics usage with quality data
- Reduced time required for data exploration and cleansing

Leading Global Bank - Data Management Enhancement and Regulatory Reporting Automation

Background

Assisted to design and implement end-to-end data management and regulatory reporting

Value Provided:

- Developed an overarching roadmap to provide clear direction and guidelines in safeguarding data integrity
- Enhanced data quality and architecture to enable accurate and timely report reconciliation
- Integration of automated controls to allow for potential discrepancies to be detected and immediate action steps taken.

One of the Largest Global Banking Institutions - BCBS 239 Implementation

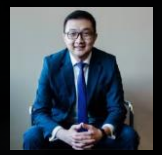
Background

BCBS 239 Implementation

Value Provided:

- Built a comprehensive data dictionary to ensure consistent data classification and metadata across departments.
- Developed an overarching framework allows the bank to perform accurate and timely monthly report reconciliation.
- Maintained high-quality data helped resolve discrepancies, leading to better decision-making.

Let’s connect!



Justin Ong
Partner, Regulatory & Financial Risk Leader
Southeast Asia
keaong@deloitte.com

Wong Nai Seng
Partner, FSI Regulatory Strategy Leader
Southeast Asia
nawong@deloitte.com

Dawn Lim
Director
Regulatory Compliance & Advisory Specialist
dawlim@deloitte.com

Deloitte.

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