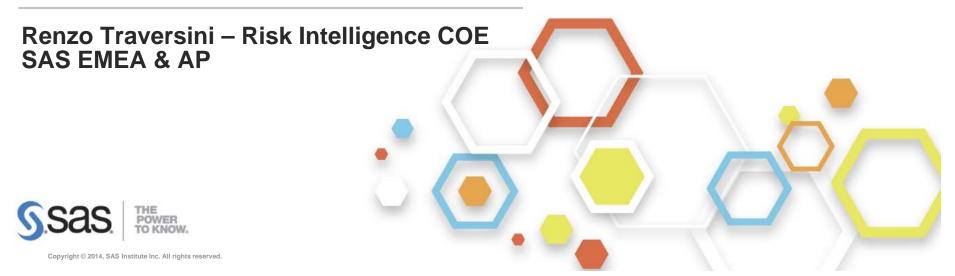
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From gap analysis to solutions BCBS239 Compliance



BCBS239 Compliance

OBJECTIVE OF THIS SPEECH

- From Gap Analysis of Risk Landscape
- To concrete implementation of Solutions
- An Action Model to fulfill BCBS239 requirements

PRINCIPLES FOR EFFECTIVE RISK DATA AGGREGATION AND RISK REPORTING

Purpose

Strengthen risk data aggregation and risk reporting practices at Banks

Expectation

Enhance Banks' risk management and decision-making processes

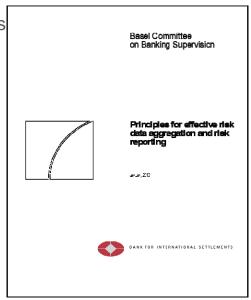
Four topics

Overarching governance and infrastructure (Principles 1, 2)

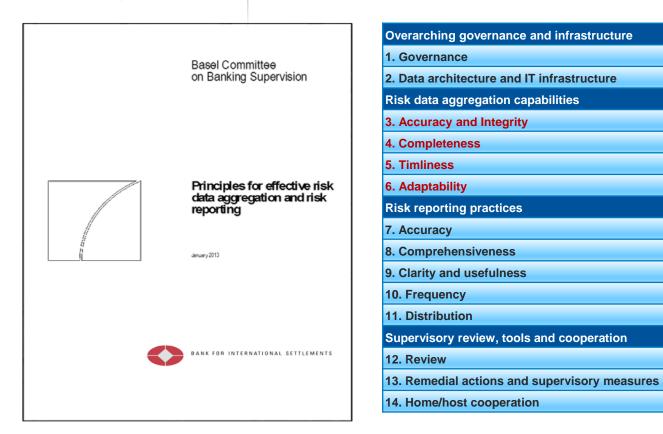
Risk data aggregation capabilities (Principles 3 to 6)

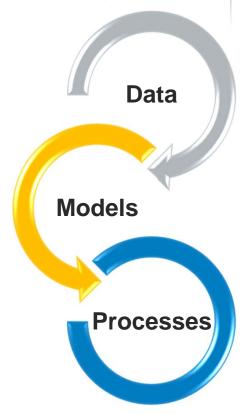
Risk reporting practices (Principles 7 to 11)

Supervisory review (Principles 12 to 14)



PRINCIPLES IN DETAIL





THE NEXT GENERATION RISK MANAGEMENT

Risk Data management

Comprehensive Risk Data Governance across Banking Group entities Full alignment with Finance

Appropriate risk analysis & reporting capabilities

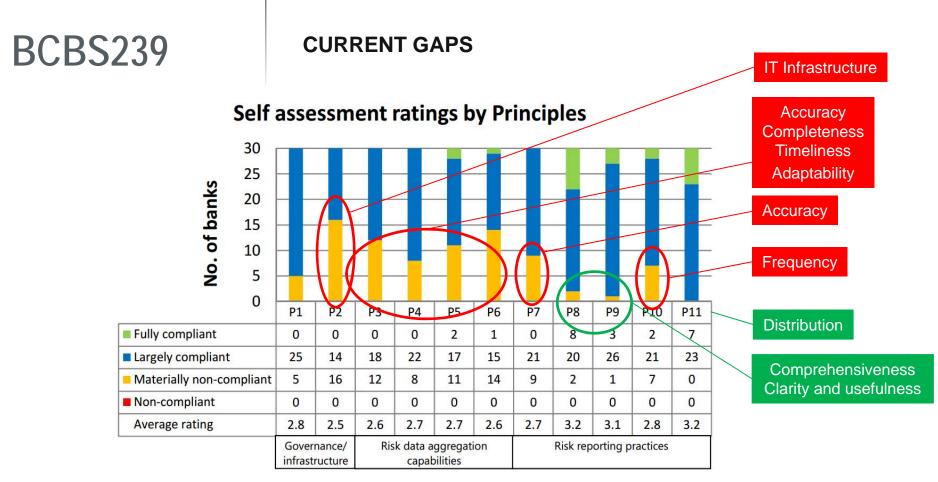
Risk modelling activities

Development and deployment environments for all risk models Validation of all internal risk models formally supported Monitoring and Maintenance system in place for all risk models

Risk Information processing and decisioning

Automation of all relevant risk processes

Performance of risk aggregation and reporting processes ensured Governance of risk decisioning fully covered



Source: Basel Committee on Banking Supervision, Progress in adopting the principles for effective risk data aggregation and risk reporting, December 2013

COMPLIANCE BY PRINCIPLES

Category	Prn	Description	Overall rating for Principle - AS IS	Overall rating for Principle - TO BE	Compliance date	Summary comments
Governance and IT	1	Governance	3	4	Dec 2015	Standardisation and formalisation of existing capabilities largely through in-flight programmes
	2	Architecture / Infrastructure	2	4	Dec 2015	Full compliance to be achieved through a) the development and implementation of a fully capable Risk Data Governance system and b) revision of risk calculation and reporting infrastructure
Data Aggregation	3	Accuracy / Integrity	2	4	Dec 2015	Implement the standards, policies, and frameworks required in the Risk Data Governance system
	4	Completeness	2	4	Dec 2015	A comprehensive data programme including data principles, clear ownership and a Data Quality Framework (within the Risk Data Governance system) to address completeness requirements
	5	Timeliness	2	4	Dec 2015	Compliance will be achieved through a combination of adoption of Data Governance standards as well as number of projects across risk areas to revise risk reporting procedures and improve calculation performances
	6	Adaptability	2	4	Dec 2015	Compliance will be achieved through a combination of a) adoption of Data Governance standards and b) revision of risk data structures
Reporting	7	Accuracy	2	4	Dec 2015	The compliance for reporting accuracy is linked with those for principle 3 on aggregation accuracy and with the deployment of a revised risk reporting system in the context of the risk management information system
	8	Comprehensiveness	3	4	Dec 2015	Implementation of risk Data Governance framework and risk management information system
	9	Clarity / Usefulness	3	4	Dec 2015	Risk management information system to deliver reporting packs for all risk governance committees across the Bank tailored to their specific needs and requirements
	10	Frequency	3	4	Dec 2015	Implement improvements to aggregation and reporting capabilities, in particular during times of stress/crisis
	11	Distribution	3 OR 4	4	Dec 2015	Formalise processes for confirmation of distribution - Implement a specific GRC application

COMPLIANCE BY FOCUS AREAS

Category	Prn	Description	Overall rating for Principle - AS IS	Overall rating for Principle - TO BE	Compliance date	Summary comments
Governance and IT	1	Governance	3	4	Dec 2015	 Implement risk data governance system Revise risk data structures Revise reporting procedures Improve calculation performance
	2	Architecture / Infrastructure	2	4	Dec 2015	
Data Aggregation	3	Accuracy / Integrity	2	4	Dec 2015	
	4	Completeness	2	4	Dec 2015	
	5	Timeliness	2	4	Dec 2015	
	6	Adaptability	2	4	Dec 2015	
Reporting	7	Accuracy	2	4	Dec 2015	 Improve aggregation and reporting capability, including stress testing
	8	Comprehensiveness	3	4	Dec 2015	Implement GRC application on risk decisioning processes
	9	Clarity / Usefulness	3	4	Dec 2015	
	10	Frequency	3	4	Dec 2015	
	11	Distribution	3 OR 4	4	Dec 2015	

AN IT-INTENSIVE IMPLEMENTATION AGENDA



AN IT-INTENSIVE IMPLEMENTATION AGENDA



 Generate a common data infrastructure for Risk & Finance data reconciliation and reporting Process Automation Business
User
support

- Overcome usage of individual productivity tools in regulatory processes
- Deliver self-service analysis & reporting tools

AN IT-INTENSIVE IMPLEMENTATION AGENDA

- Implement a comprehensive Data Governance system
- Ensure management of data quality issues
- Measure and publish measure data adeherence to compliance

Risk Data

architectural solutions Adopt solution for model

management framework implementation

Adopt high-performance

 Generate a common data infrastructure for Risk & Finance data reconciliation and reporting

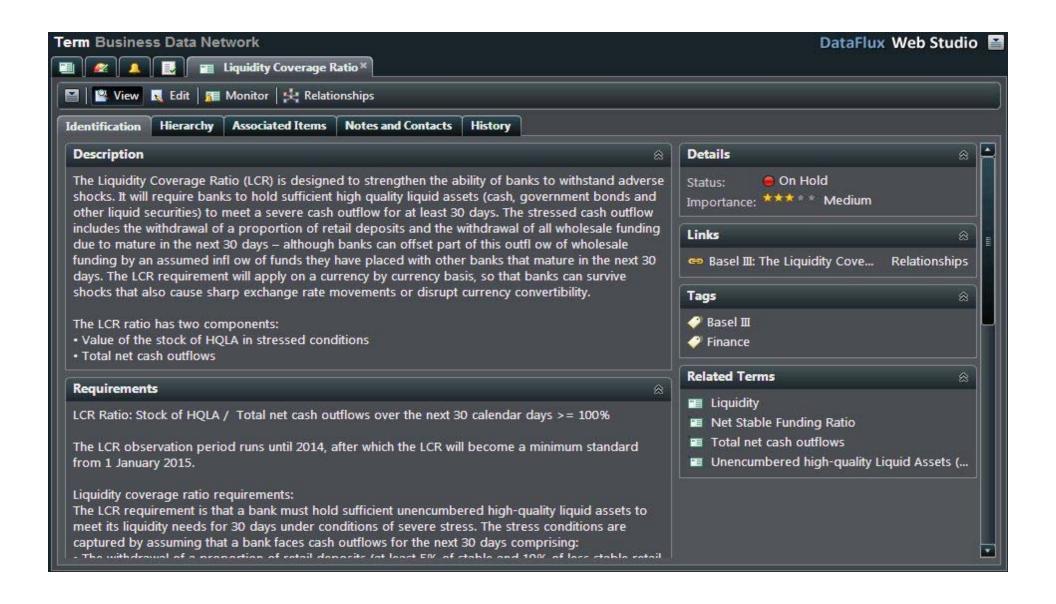
Process Automation **Business** User support

Risk

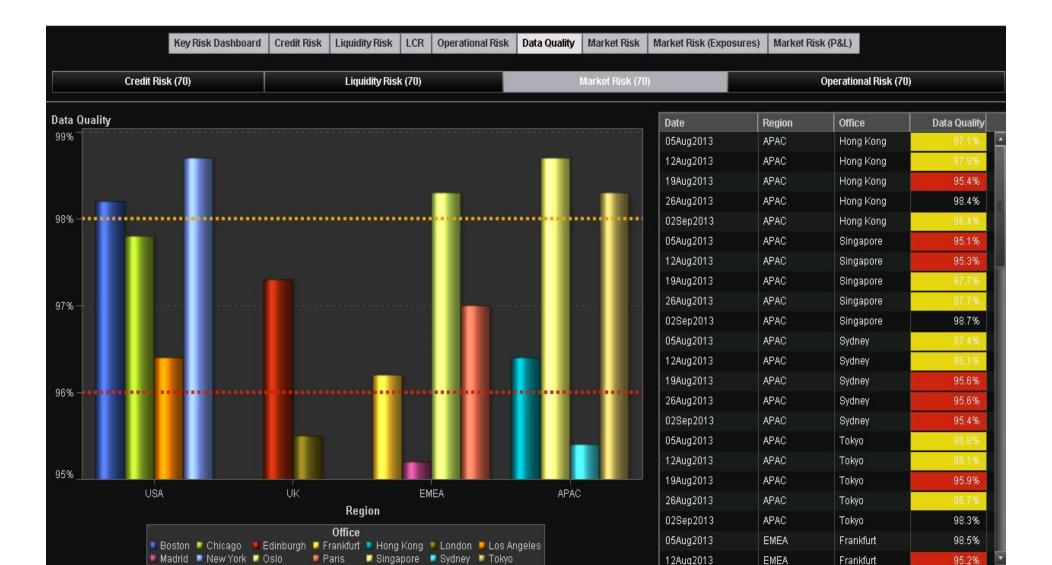
Information

Processing

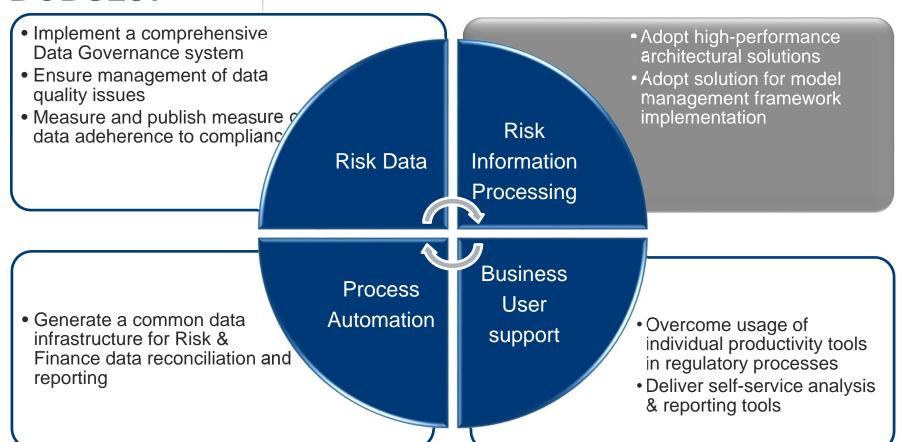
- Overcome usage of individual productivity tools in regulatory processes
- Deliver self-service analysis & reporting tools





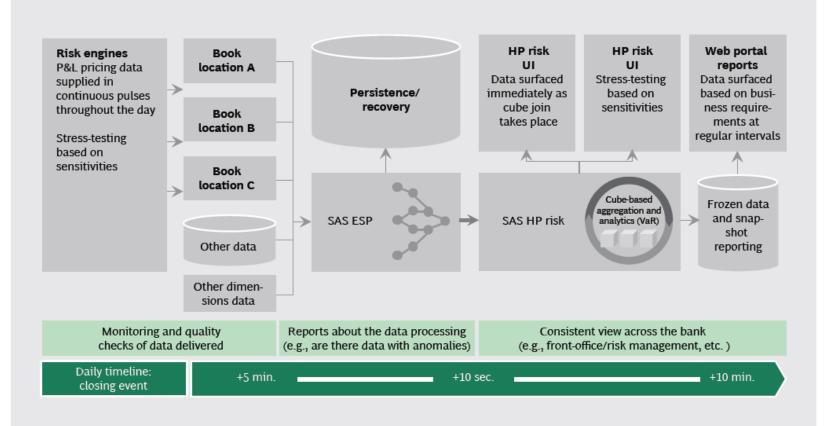


AN IT-INTENSIVE IMPLEMENTATION AGENDA



Group Market Risk reporting – trading opertions

EXHIBIT 5 | Market risk reporting was improved using HPT



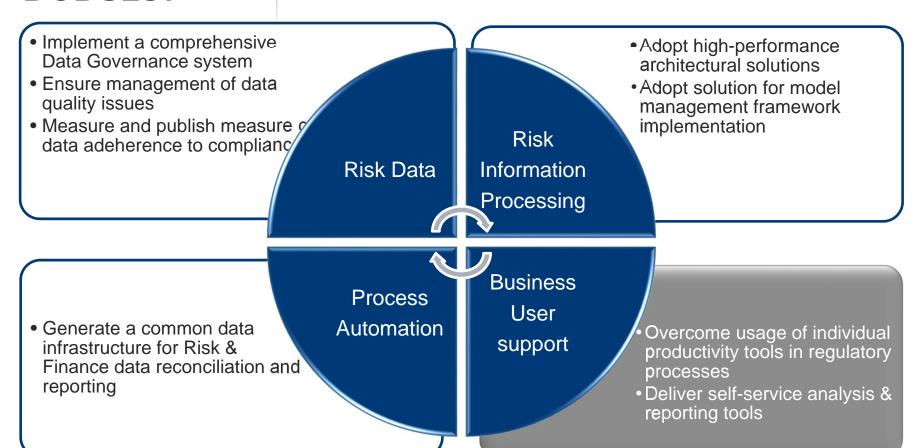
Source: High Performance Bank Steering – Boston Consulting Group and SAS, August 2013

bcbs239

IN-MEMORY GRID COMPUTING: TIMELINESS, ACCURACY AND ADAPATIBILITY



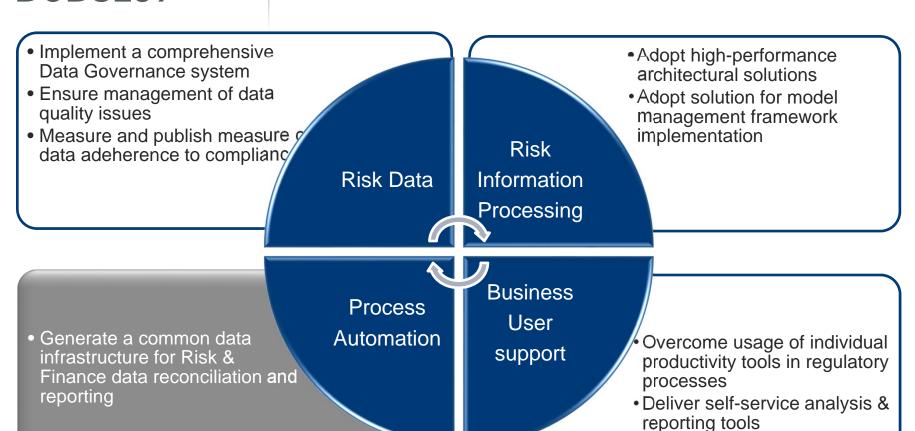
AN IT-INTENSIVE IMPLEMENTATION AGENDA



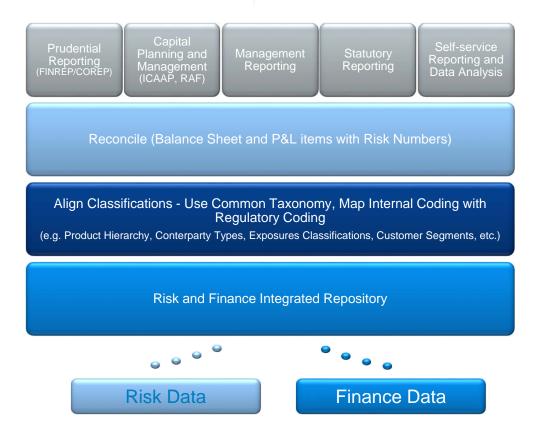
RISK EXPLORATION



AN IT-INTENSIVE IMPLEMENTATION AGENDA



RISK AND FINANCE DATA INTEGRATION





SAS ON-GOING PROPOSALS - GSIBS

- Data Governance system
 - Based on SAS Data Governance solution
- Data Quality Monitoring system
- Risk processing performance improvements / new risk model deployment architecture
 - In-memory solutions, In-database solutions, Grid
- Model Lifecyle Management,
 - Internal Rating and credit scoring models primarily
- Credit Strategy / Credit decisioning
- Market Risk Calculation performance improvement
 - Based on Event Stream Processing solution and HPRisk

- Stress Testing Solution
 - · Specific risk categories
 - Firmwide risk stress testing
- Risk Information management system
 - Based on Risk Repository and Capital Planning and Management Solution
- Risk Analysis and Reporting
 - Based on In-memory data architecture, SAS HPRisk and Visual Analytics
- TOP exposure reporting
- Group risk cockpit
- Regulatory Capital calculation / speed up
- Capital Forecasting, ICAAP

USE CASE - AREAS OF COOPERATION

- Credit risk management in Retail and Commercial
 - Improve quality & performance of credit scoring / internal rating component models
 - Model performance monitoring
 - Credit Risk monitoring & control
 - Regulatory Capital calculation
- Financial Planning and Monitoring RAF
 - Capital Planning and Management
- Group Risk Reporting
 - Common Finance & Risk data structure for business reporting
 - Advanced Analysis and Reporting
- Stress Testing engine
- Validation of risk models
 - Operational Risk AMA model

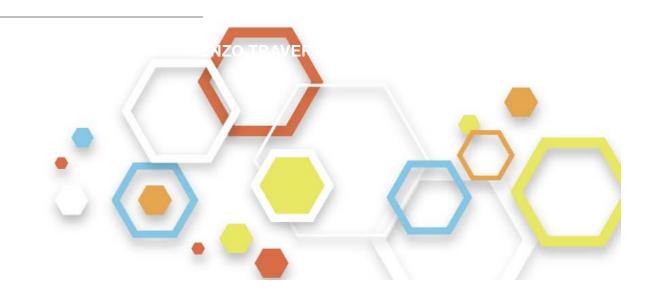
SUMMARY / CONCLUSIONS

- BCBS239 is generating high pressure on IT for improvement in risk management infrastructure and SLA
- To deliver the required capabilities IT will have to consider substantial options
 - High performance technology / applications
 - Self-Service Analysis & Reporting
 - Integration of detailed Risk and Finance data
- The successfull adoption of those solutions can improve substantially Banks competitive position
- After being initially set on Data, focus will extend to Models and Process

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THANK YOU





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