Risikomanagement im Rahmen der integrierten Banksteuerung

Dr. Michael Wolf, Principal Business Advisor Banking (SAS)
Overview

- Risk Management: Functional and Non-Functional Requirements
- Technology as Enabling Factor
- New Dimensions of Integrated Risk Management
Market trends for risk technology: Regulatory Requirements

Comprehensive Joint White Paper by SAS and BCG

- **Basel III**
  - Capital Requirements
  - Liquidity Management
  - Risk Management

- **IFRS 9**
  - Fair Value Calculation
  - Impairment
  - Hedge Accounting

- **ICAAP**
  - Capital Allocation Process
  - Stress Scenarios
Impacts on technological requirements
Layered – architecture for risk departments / banks

- Impacts on all layers, primarily scenario and calculation layer
- Standardization of technology by layer is industry best practice,
- **Scenario Based Working** gets priority instead of monthly static report production
- **Near-Realtime** Analytical Environments define the competitive strength
- **Managed Self Service Environments** for business departments are increasingly important due to requirement complexity
- **Shared method libraries** (f.e. pricing) are main drivers for single value of truth
- Strategic, **cross-departmental decision**
- Metadata-Based analytical processes will be needed for compliance purposes
### Fulfillment of mandatory non-functional requirements in IT and “shadow” IT:

**Banking Industry Experience**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>IT</th>
<th>Non Standard IT</th>
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</thead>
<tbody>
<tr>
<td>IT costs and TTM for implementation of new requirements</td>
<td>even small changes are expensive - backlog</td>
<td>Fast, little IT budget required, flexible</td>
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<tr>
<td>Capability to deal with unclear and continuously changing requirements, extremely flexible ad-hoc reports (with new data)</td>
<td>---</td>
<td>+++</td>
</tr>
<tr>
<td>Compliance, operational stability</td>
<td>+++</td>
<td>Often: ---</td>
</tr>
<tr>
<td>Costs Run the bank (People, servers, tools, reconciliation)</td>
<td>---</td>
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<tr>
<td>Consistency of data and results</td>
<td>Inside system +++, cross systems ---</td>
<td>Inside specific appl.: ++, Otherwise typically: ---</td>
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<tr>
<td>Scalability and readiness for high performance computing</td>
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</tbody>
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Substantial proportion of reports and analyses (up to 80%) come from “non standard IT” which originally was meant to be used for (non-productive) prototyping
Future architecture should ...

- Allow substantially decreased costs (development, maintenance, infrastructure, manual consolidation) and reduced development time
- Ensure full flexibility for end-user (allowing them to make their prototype developments and ad-hoc reports within the “official” IT structures)
- Allow smooth transition from user-built “prototypes” to IT
- Ensure compliance, consistency of data and reports
- Provide a low risk and smooth transition path from current state to target architecture
- Be prepared for full scalability and high performance computing
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- **Technology as Enabling Factor**
- New Dimensions of Integrated Risk Management
Infrastructure and Technology as Enabling Factors

Scalability, Big Data and High Performance

IT
State of the art infrastructure

Financial Mgmt

Analytical Risk Functions
efficient, flexible, link to finance
Infrastructure and Technology as Enabling Factors

**High Performance and BIG DATA Scalability**
- GRID Computing, In-Database Computing, In Memory Analytics
- Systematic approach to design enterprise specific path to target architecture
- Scalability
- New architectural visions possible (due to decreasing restrictions: data and performance)

**IT State-of-the-art infrastructure**
- Standardization and automation of Data Management (D-Integration, Quality)
- Analytics (incl. Data Mining, Prediction, OR)
- Reporting (Dashboards, OLAP, WEB, MS-Office)
- Metadata
- Pre-requisite for High Performance Computing

**Analytical Risk Functions State-of-the-art infrastructure**
- Generic, configurable risk functions – open for individual extensions
- Predefined Solutions for many domains (EGRC, credit risk, market risk, capital management, performance/P&L, Liquidity, ALM, Fraud)
- Re-use of existing functions (SAS, C, R, MatLab)
- End-to-end: Data integration, Analytics, Reports
- Optimized in terms of performance
- Pre-requisite for High Performance Computing
Infrastructure and Technology as Enabling Factors

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Analytical Risk Functions
efficient, flexible, link to finance
SAS® Data Integration Studio
Benefits of consistent Metadata

The metadata model allows to track

- where data come from (lineage) and
- in which objects they are being used
Business Analyst – Ad-hoc Analysis
Integration in MS Excel
Infrastructure and Technology as Enabling Factors

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## SAS® for Banking

### Risk
- Firmwide Risk
- Credit Risk/Counterparty Risk
- Market Risk
- Asset/Liability Management
- Operational Risk
- Fraud/Financial Crimes

### Customers
- Customer Experience Analytics
- Customer Profitability & Relationship Pricing
- Acquisition, On-Boarding & Retention
- Cross-Sell & Up-Sell
- Collections Optimization
- Marketing Optimization

### Finance
- Regulatory Compliance
- Capital Allocation & Management
- Legal/Financial Consolidation & Reporting
- Cost & Profitability Management

### Operations
- Performance Measurement & Reporting
- Workforce Planning & Management
- IT Performance Management
- Sustainability/Green Initiatives
SAS Solution Architecture

SAS Business Intelligence / Risk Reporting Framework

SAS Business Intelligence / Risk Reporting Framework

SAS Data Management Framework

EDW
Finance

DDW

Risk-DW

Local hub

Operational Data
(SKP, OTC-IB, Balance-Sheets)

External data

Explorative Data

SAS RMfB

SQL*, Regression, Forecast, OR, Data-mining

Exploration

Reporting Repositories

Analytical Data Marts

SAS Data Store for Banking
Infrastructure and Technology as Enabling Factors

Scalability, Big Data and High Performance

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Financial Mgmt

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SAS® High Performance Risk
SAS ports its complete analytical infrastructure to „High Performance“

⇒ In-Memory Grid can also be used for standard analytical work

⇒ Currently 50% of procedures already ported (logistic regressions, summary, correlations, forecasting, …)
SAS Scalable Risk Management Framework

Data Tier
- SAS Data (SAN) and SAS SPDS
- Relational Databases; MPP Appliances

Application Tier
- SAS Grid Architecture
  - SAS Risk Management for Banking Server
    - Predictive Modeling
    - Model Management
    - Ad-hoc Analysis
    - Reporting Engine
    - OLAP Analysis
    - Data Integration
    - Simulation

Web Tier
- SAS Web Applications
  - Reporting Applications
  - Analytical Dashboards
  - Workflow

Client Tier
- SAS Analyst’s Desktops
- SAS Web Reporting Clients

RiskApp 1
RiskApp 2

= growth
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SAS® High Performance Risk
Value: Strong decrease of runtimes in several projects

Test Scenario
- Portfolio with Multi-Million financial instruments / positions
- Complex Counterparty Analysis with Monte Carlo Simulations
- Computation in traditional environments took days
Well Defined Way from Current State to Target

Phase 1
- First Production Environment for pilot project
- SAS EBI
- SAS DI only

Phase 2
- BI Platform Roll Out
  - For all stages (SAS EBI)
  - SAS DI only
  - Simple 3 machine Deployment
  - 1 Metadata
  - 1 JBOSS Mid Tier
  - 1 Compute

Phase 3
- Add Additional SAS Compute Tiers – using separate logical VMs

Phase 4
- Cluster SAS Mid Tier

Phase 5
- Implement Clustered File System to support Compute Load Balancing

Phase 6
- Implement SAS Grid

Global BI RoadMap

- Deploy SAS Solutions based on individual Customer Project Requirements

- Three Months Prep required
- One Month Prep required
- Two Months Prep required
- 6 to 12 Months Prep required
- 6 Months Prep required

- There are no optional phases in this road map
- No work is throw away – each phase builds upon earlier releases.
- Depending on Customer requirements, we may end up going straight to a later phase
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Integrated Risk Management
Integrated Risk Control – The SAS vision
Consistent data, calculation and process flow linking

- Operational systems
- Calculation engines
- Mgmt dashboard

i.e. applying the
Single point
of truth (SPoT)
concept to data
and algorithms
1) Data Gathering

2) Risk Processing

3) Data/Result consolidation and enrichment

4) Return and Position Processing

5) Result Presentation

6) Simulation: repeat steps 2-5 as results „suggest”
Questions?