



# Business Analytics and Optimization for Banking

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***Bună dimineața!***



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## Professional Experience

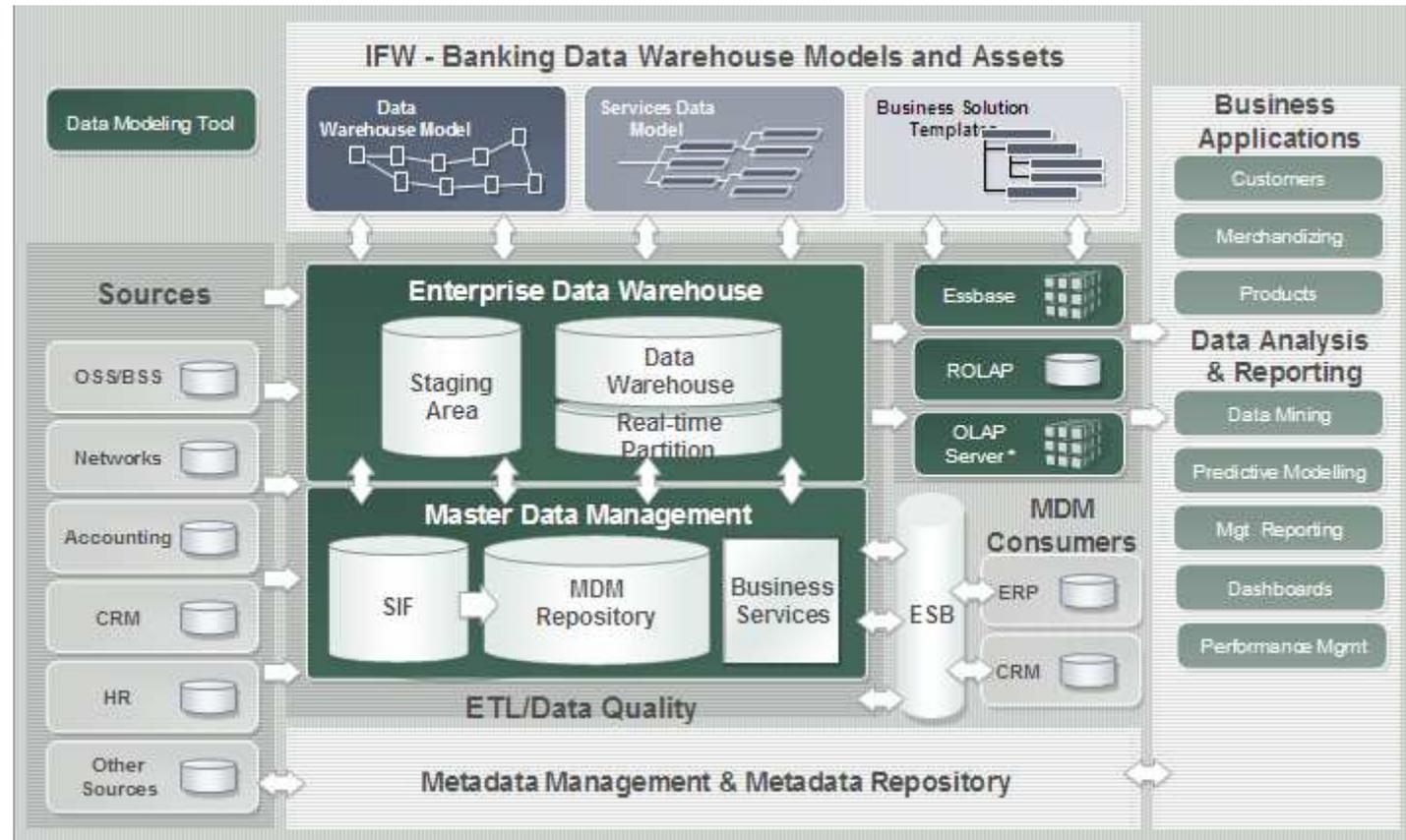


years	role	organisation	clients
1985 – 1993	software developer	IBM Vienna Software Development Laboratory	
1994 – 1995	systems architect	IBM Consulting Group	Generali
1996 – 2002	application development consultant (Y2K, EURO)	IBM Professional Services	Bank Austria UNIQA Telekom Austria
2003 – 2008	software architect for banking	IBM Software Group Austria	Bank Austria Raiffeisen ARZ(Volksbanken) BAWAG/PSK Erste Bank
2009 -	software architect for information integration	IBM Software Group CEE	cross industry



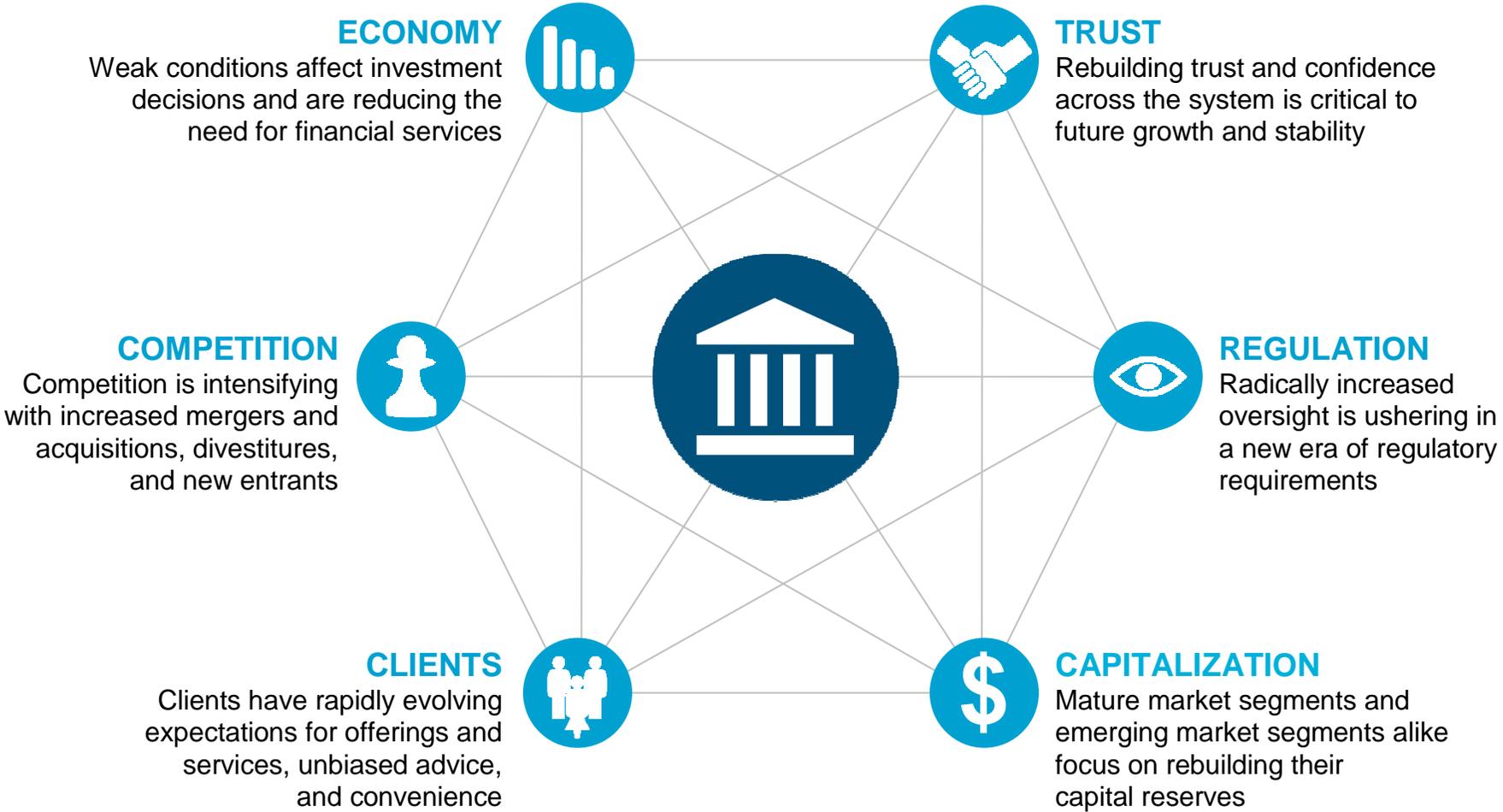
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## Areas of Expertise





# Dramatic changes across the industry require new approaches to help maximize profitability and returns



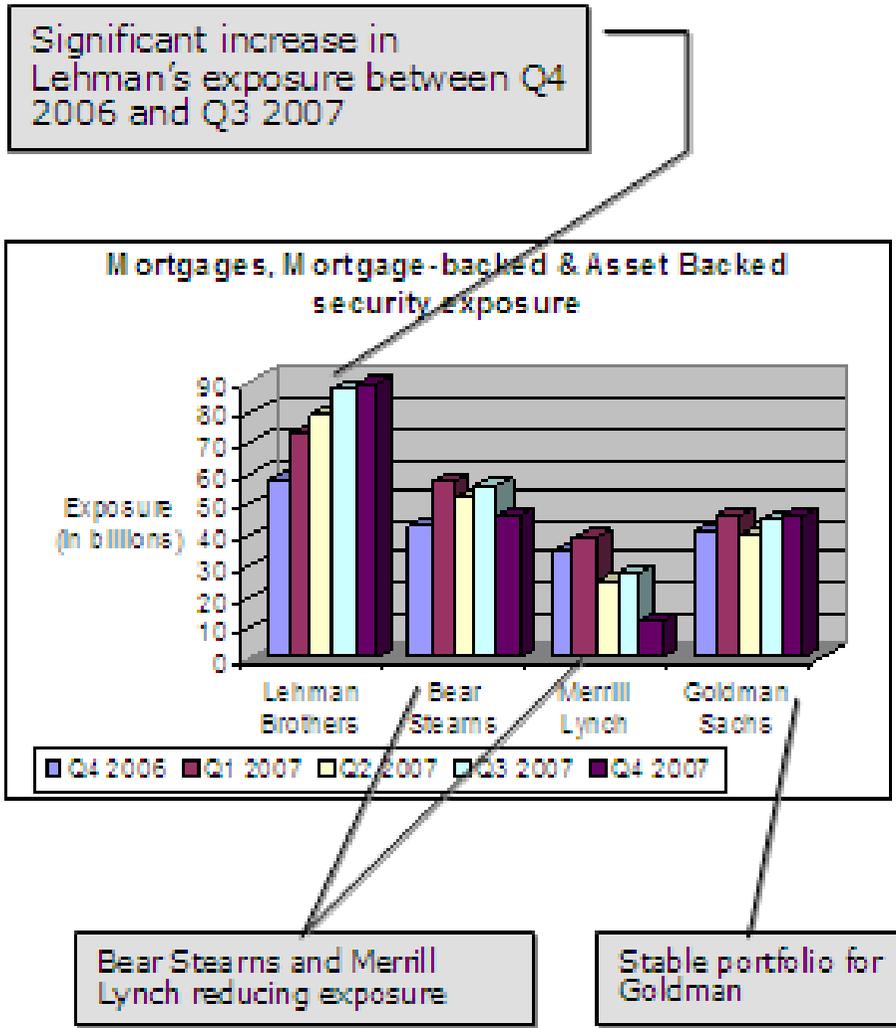


In recent years, no other industry has been so much in public focus as the banking industry

- 2008+ economic crisis – and the roles of banks
- Public dispute of banking managers salaries and bonus payments
- Public dispute of tax payers money in support of troubled banks financial survival
- Roles of banks in economic recovery
  
- Could (should) the crisis have been foreseen?



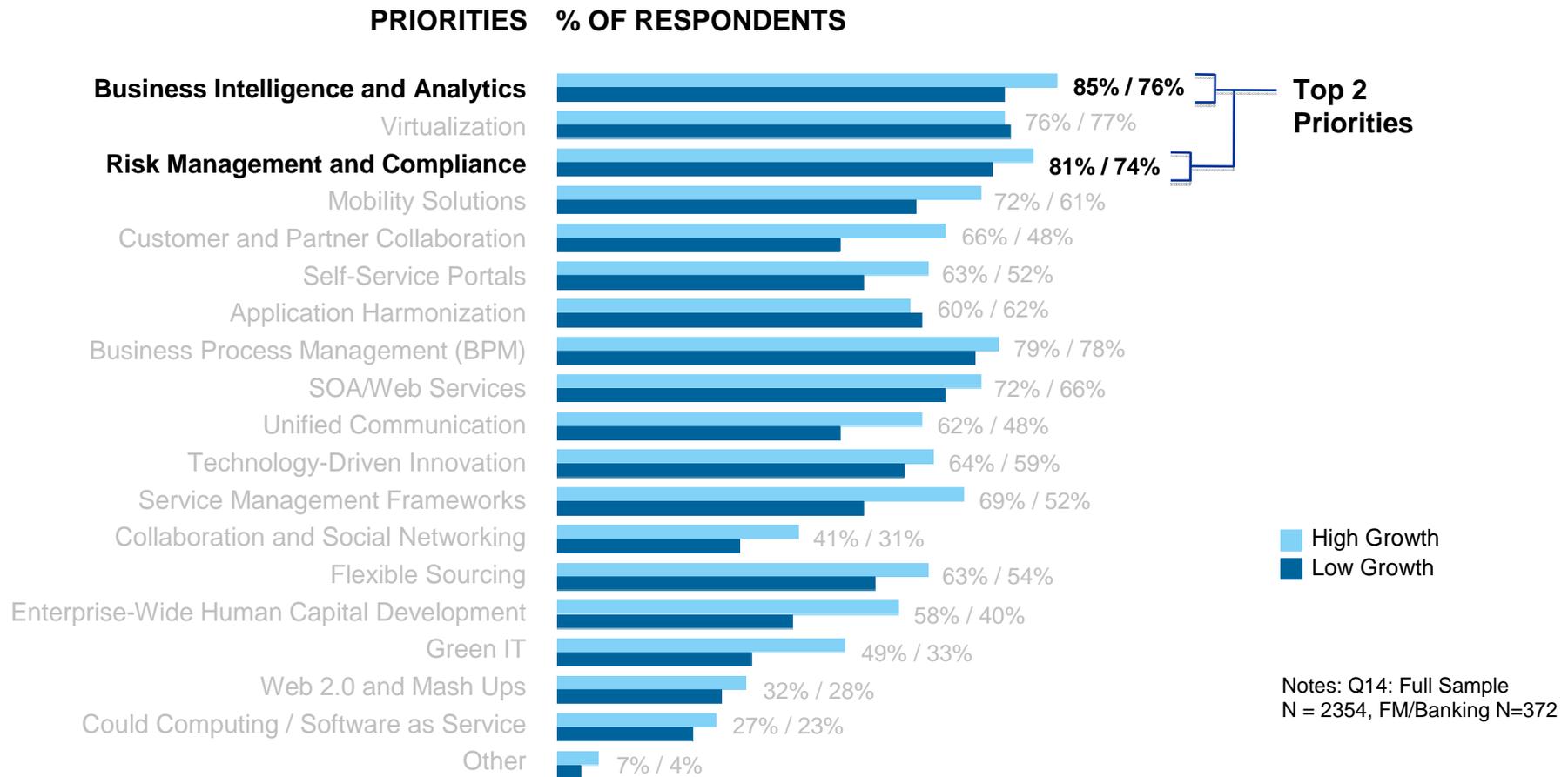
# An example of possible prediction (?)







# Banking and FM CIOs have identified BI/BA and Risk and Compliance as their top 2 priorities for enhancing competitiveness.





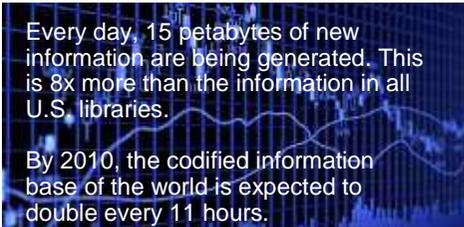
And that has not changed much in 2011...

### 2011 CIO Study highlights

To increase competitiveness, 83 percent of CIOs have visionary plans that include business intelligence and analytics, followed by mobility solutions (72 percent) and virtualization (67 percent). Since the 2009 survey, CIO interest in cloud computing has nearly doubled (60 percent), a reflection of the growing need to simplify access to information in a cost-effective manner.



# Yet challenges exist around volume, variety (diversity), and speed of data creation (and needed decisions)



Every day, 15 petabytes of new information are being generated. This is 8x more than the information in all U.S. libraries.

By 2010, the codified information base of the world is expected to double every 11 hours.

**Volume of Digital Data**

**Lack of Insight**  
1 in 3 managers frequently make critical decisions without the information they need



Today, 80% of new data growth is unstructured content, generated largely by email, with increasing contribution by documents, images, and video and audio.

**Variety of Information**

**Inefficient Access**  
1 in 2 don't have access to the information across their organization needed to do their jobs



70% of executives believe that poor decision making has had a degrading impact on their companies' performance

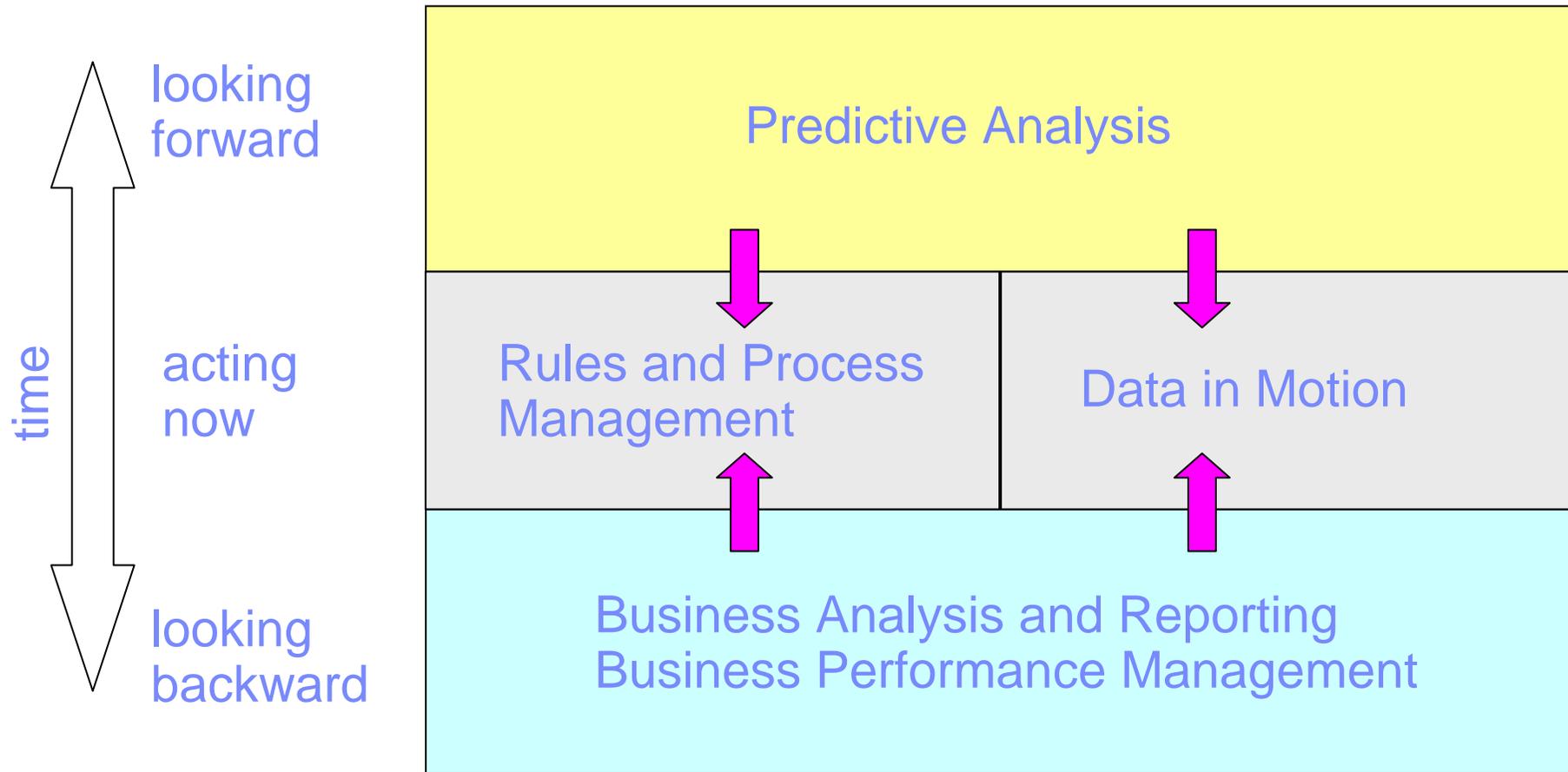
Only 9% of CFOs believe they excel at interpreting data for senior management

**Velocity of Decision Making**

**Inability to Predict**  
3 in 4 business leaders say more predictive information would drive better decisions

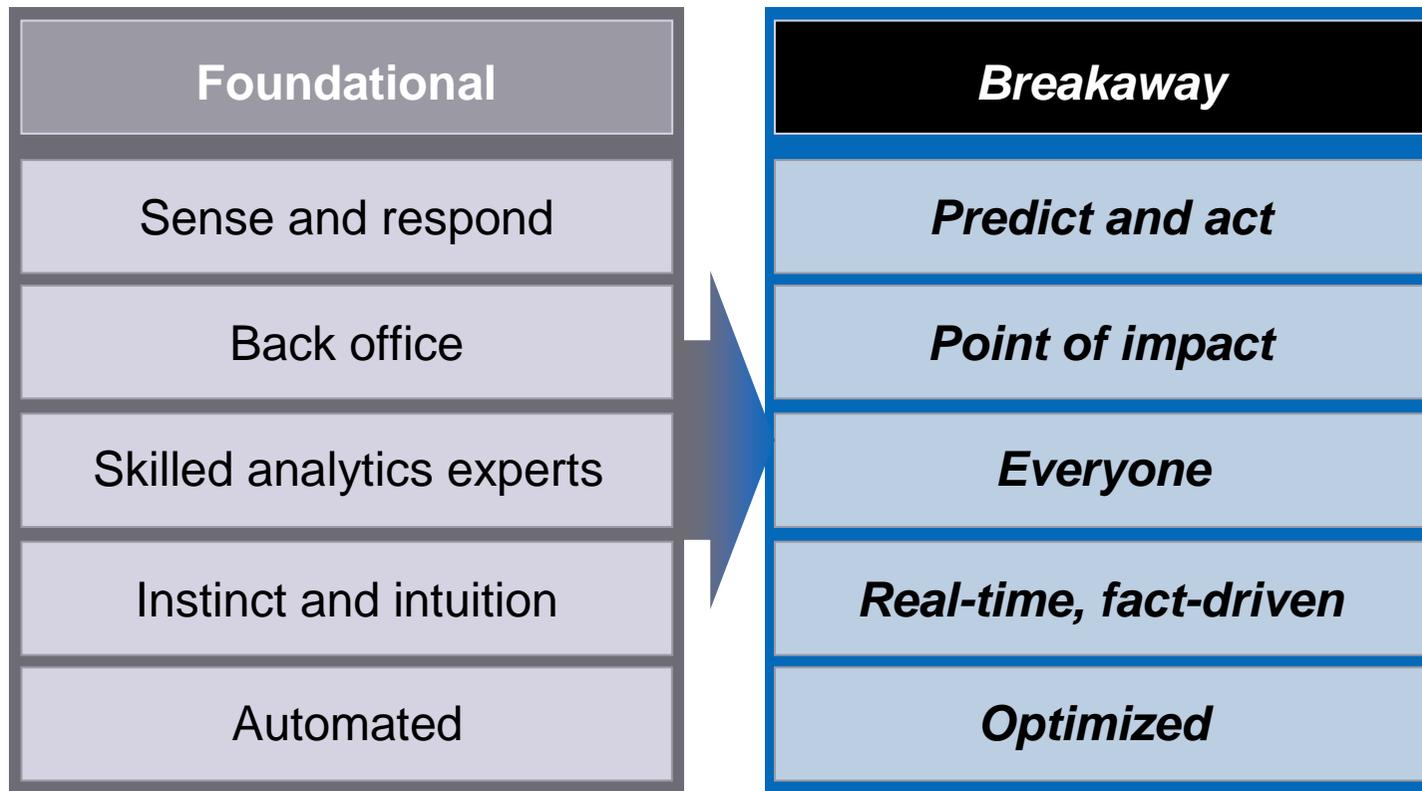


# A new Business Analytics capability map is needed





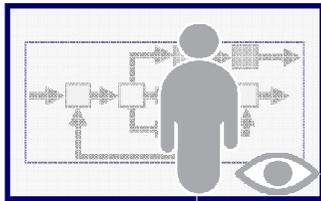
## Transition towards BAO with actionable insights





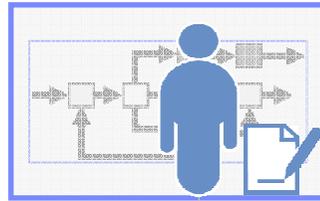
Example: imagine if your bank could ...

*...offer new customer, menu-selected products, price and terms within Bank's optimal levels*



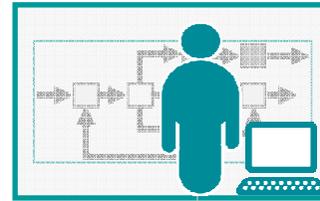
**Product Manager**

*...use adaptive risk control at the customer and transaction level?*



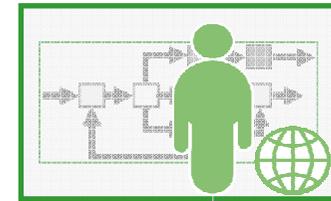
**Loan Officer**

*...cross sell optimal product, right customer, right time?*



**On-line Channels Manager**

*...stop a large wire transfer when predictive analytics shows likely fraud?*

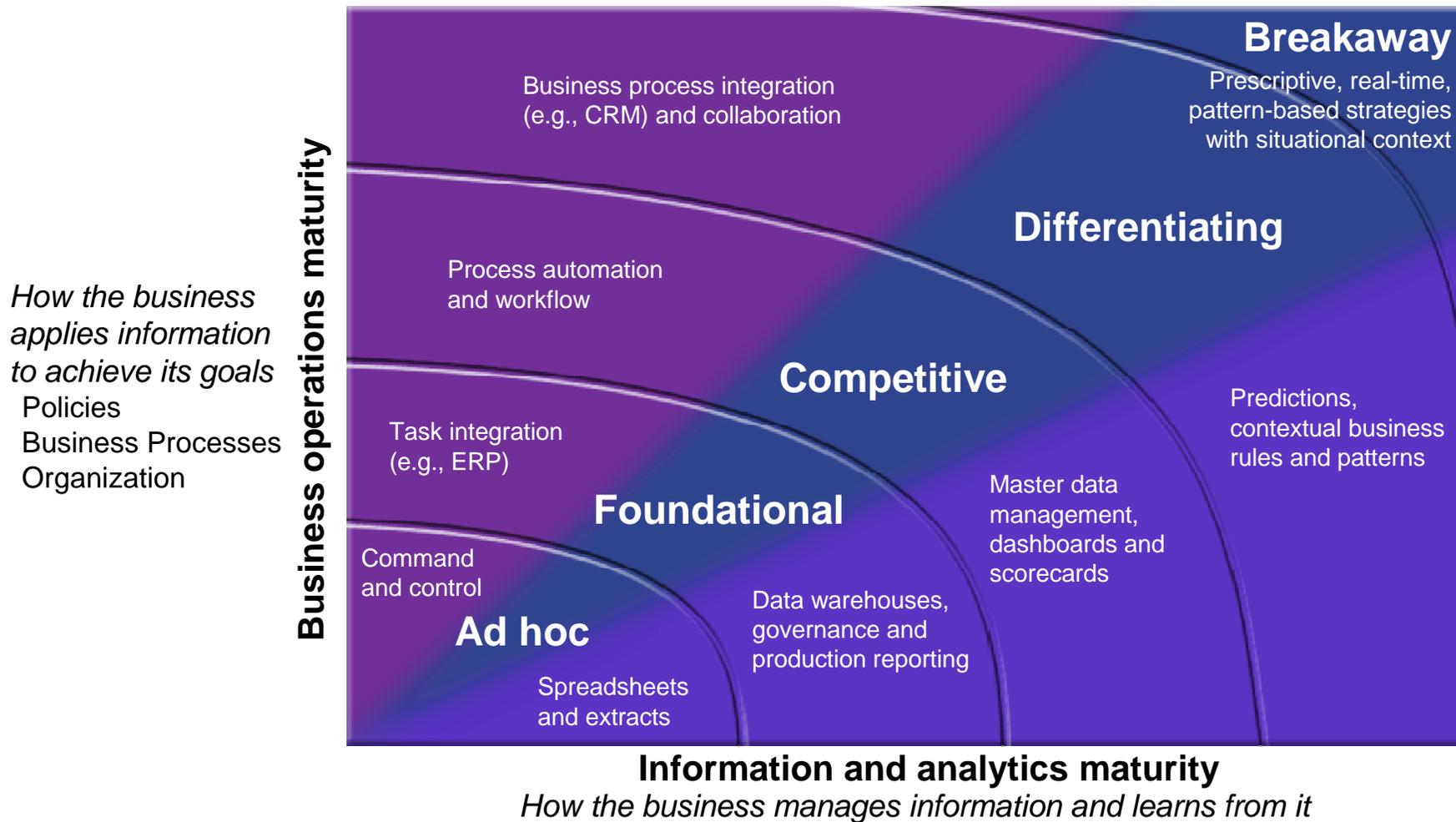


**Branch Manager**

***Next generation of efficiencies will come from applying analytics to optimize decisions at every contact point....made possible by enabling pervasive, predictive real-time decisions at the point of impact***



# IBM Business Analytics Maturity Model



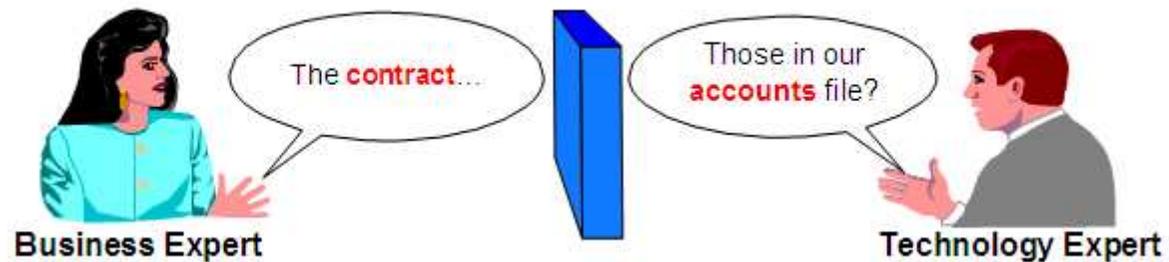
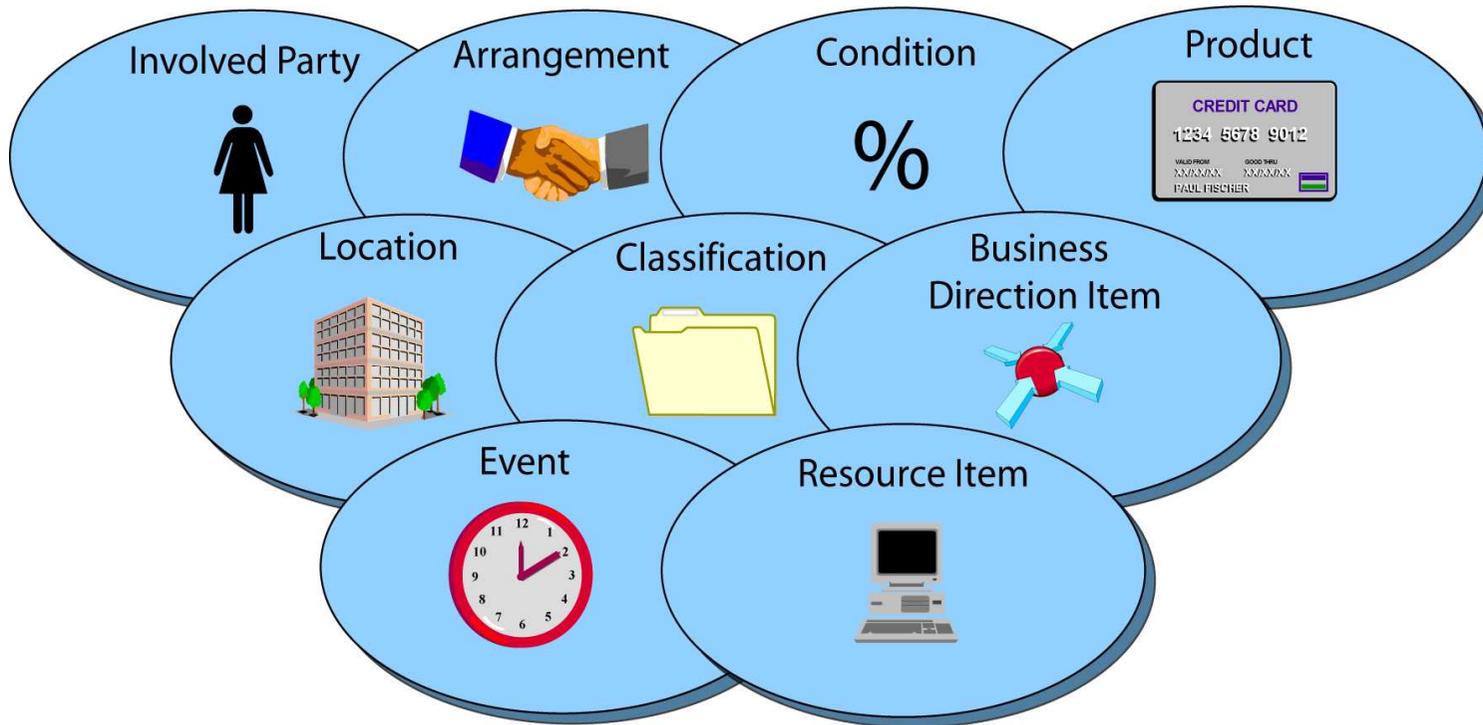


## Essential capabilities in BAO for banking

- Trusted information
- Reporting and analysis
- Business performance management
- Predictive analysis and mining
- Realtime analytics
- Business rules (process) integration



# BAO capabilities (1): trusted information – based on an agreed, shared conceptual model





## BAO capabilities (2): analysis and reporting – driven by business requirements and templates

<p><b>Relationship Marketing</b></p>		<ul style="list-style-type: none"> <li>• Customer Interaction Analysis</li> <li>• Customer Investment Profile</li> <li>• Individual Customer Profile</li> <li>• Wallet Share Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Customer Complaints</li> <li>• Delinquency Analysis</li> <li>• Customer Loyalty</li> <li>• Market Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Campaign Analysis</li> <li>• Cross Sell Analysis</li> <li>• Customer Attrition Analysis</li> <li>• Customer Behavior</li> <li>• Lead Analysis</li> </ul>
<p><b>Profitability</b></p>		<ul style="list-style-type: none"> <li>• Transaction Profitability</li> <li>• Activity Based Costing Analysis</li> <li>• Insurance Product Analysis</li> <li>• Investment Arrangement Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Profitability Analysis</li> <li>• Channel Profitability</li> <li>• Customer Lifetime Value</li> <li>• Customer Profitability</li> <li>• Location Profitability</li> </ul>	<ul style="list-style-type: none"> <li>• Product Profitability</li> <li>• Product Analysis</li> <li>• Organization Unit Profitability</li> <li>• Performance Measurement</li> <li>• Business Procedure Performance</li> </ul>
<p><b>Risk</b></p>		<ul style="list-style-type: none"> <li>• Interest Rate Risk Analysis</li> <li>• Customer Credit Risk Profile</li> <li>• Credit Risk Assessment</li> <li>• Credit Risk Mitigation Assessment</li> <li>• Securitization Analysis</li> <li>• Operational Risk Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Outstandings Analysis</li> <li>• Portfolio Credit Exposure</li> <li>• Security Analysis</li> <li>• Liquidity Risk</li> <li>• Collections Analysis</li> <li>• Insurance Risk Profile</li> </ul>	<ul style="list-style-type: none"> <li>• Authority Profiling</li> <li>• Credit Risk Analysis</li> <li>• Debt Restructuring</li> <li>• Involved Party Exposure</li> <li>• Location Exposure</li> <li>• Non Performing Loan</li> <li>• Operational Risk Loss Analysis</li> </ul>
<p><b>Asset &amp; Liability Management</b></p>		<ul style="list-style-type: none"> <li>• Interest Rate Sensitivity</li> <li>• Liquidity Analysis</li> <li>• Short Term Funding Management</li> <li>• Financial Management Accounting</li> </ul>	<ul style="list-style-type: none"> <li>• Capital Allocation Analysis</li> <li>• Capital Procurement</li> <li>• Credit Loss Allowance</li> <li>• Funds Maturity Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Net Interest Margin Variance</li> <li>• Structured Finance Analysis</li> <li>• Equity Position Exposure</li> <li>• Income Analysis</li> </ul>
<p><b>Compliance</b></p>		<ul style="list-style-type: none"> <li>• European Central Bank Reporting</li> <li>• Financial Capital Adequacy Analysis</li> <li>• Structure Of Regulatory Capital</li> <li>• Foreign Financial Account Analysis</li> <li>• Suspicious Activity Analysis</li> <li>• Transaction Activity Analysis</li> <li>• SOA Balance Sheet Analysis</li> <li>• SOA Cash Flow Analysis</li> <li>• SOA Statement Of Change In Shareholders' Equity Analysis</li> <li>• SOA Statement Of Income Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Balance Sheet Portfolio Basis Approach Analysis</li> <li>• Balance Sheet Classified Approach Analysis</li> <li>• Balance Sheet Order Of Liquidity Approach Analysis</li> <li>• Balance Sheet Net Assets Approach Analysis</li> <li>• Cash Flow Direct Analysis</li> <li>• Cash Flow Indirect Analysis</li> <li>• SOA Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Cash Flow Direct Financial Institution Analysis</li> <li>• Cash Flow Indirect Financial Institution Analysis</li> <li>• Income Statement By Function Analysis</li> <li>• Income Statement By Nature Analysis</li> <li>• Income Statement Financial Institution Approach Analysis</li> <li>• Statement Of Changes In Equity Analysis</li> </ul>



## BAO capabilities (2): analysis and reporting – example of requirements template: Operational Risk Assessment

Purpose	To analyze the financial institution's operational risks, the types or causes of the operational risks, and the amount of regulatory capital required to provide liquidity for the financial institution against the effect of the operational risks.
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Sample Measures	<ul style="list-style-type: none"> <li>▪ Revenue Total</li> <li>▪ Operational Risk Alpha</li> <li>▪ Standardized Operational Risk Indicator Amount</li> <li>▪ Basic Operational Risk Regulatory Capital Amt</li> <li>▪ Operational Risk Unexpected Loss</li> <li>▪ etc.</li> </ul>
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Sample Dimensions	<ul style="list-style-type: none"> <li>▪ Risk Management Category</li> <li>▪ Line Of Business Reporting Group</li> <li>▪ Risk Assessment Frequency</li> <li>▪ Loss Event Type</li> <li>▪ etc.</li> </ul>
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### **Examples of BST usage**

- Supports **regulatory capital** analysis, with rollup to line of business reporting group and risk category
- Supports **exposure amount** analysis by geographic area
- Supports **risk score** analysis with granular rollup by time period
- Supports **operational key risk indicators** analysis at loss event and risk management category levels
- etc.



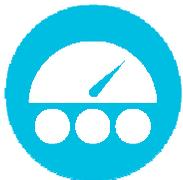
## BAO capabilities (3): business performance management

### Business Performance Management

Allows decision makers at virtually all levels of the organization to gain insight into business performance and data to support and guide actions.

#### How are we doing?

Deliver immediate insights into business performance



**Dashboards/  
Scorecards**



**Reports**

#### Why?

Deeper analysis of trends and patterns



**Ad hoc  
Query**



**Content &  
Trend analysis**

#### What should we be doing?

Foresight to plan and allocate resources



**Planning/  
Budgeting**



**Predictive  
Modeling**



## BAO capabilities (4): predictive analysis and mining

### Clustering

- Exploratory data analysis
- Reveals natural groups within a data set
- Distance Measure: No prior knowledge about groups or characteristics
- Not always an end in itself

**Customer Segmentation**

### Associations / Sequences

- Finds things that occur together
- Associations can exist between any of the attributes
- Discovers association rules in time-oriented data
- Find the sequence or order of the events

**Market Basket Analysis, Next logical purchase**

### Classification

- Predicts an outcome (true /false) based on a set of inputs.
- Modelers pre-defines input and outputs

**Fraudulent case/transaction prediction**

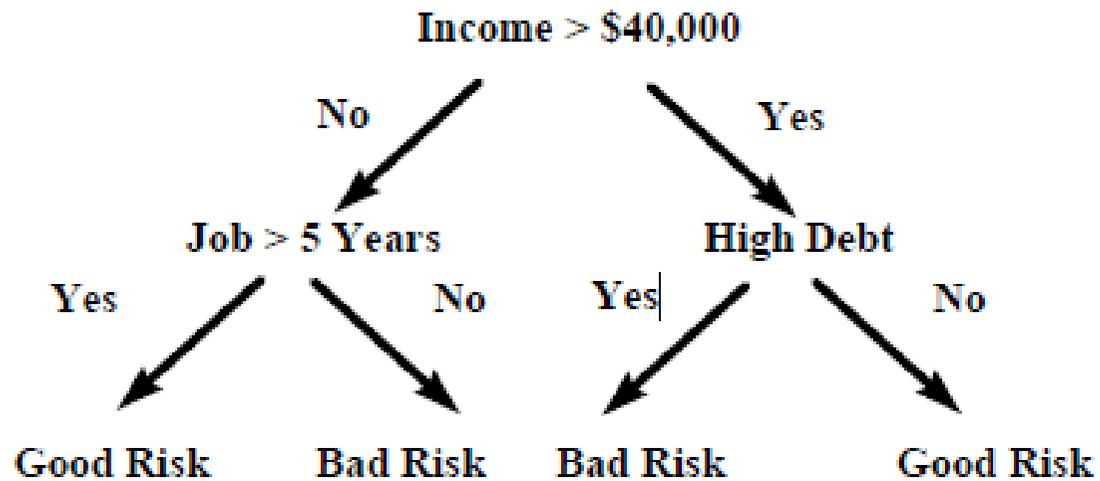
### Regression

- Predicts a numeric outcome based on a set of specified inputs.
- Modelers pre-defines input and outputs

**Marketing campaign response rate prediction**



BAO capabilities (4): example of simplified "decision tree" – credit risk rating





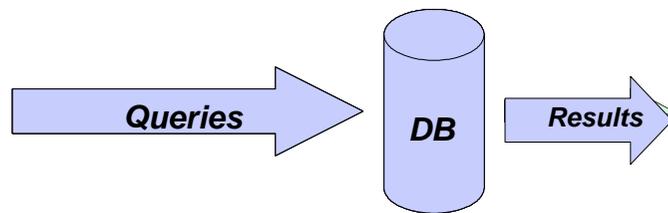
# BAO capabilities (5): realtime analytics: data in motion

## Traditional Analysis

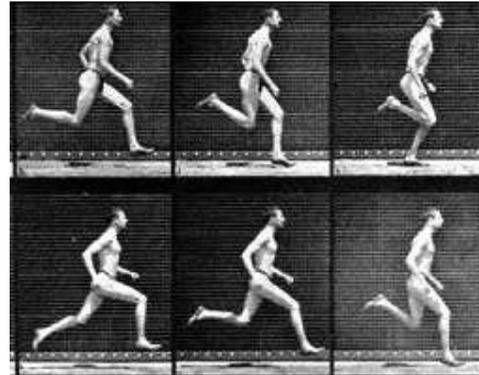


### Historical fact finding with data-at-rest

Batch paradigm, pull model  
Query-driven: submits queries to static data  
Relies on Databases, Data Warehouses



## Stream Analysis



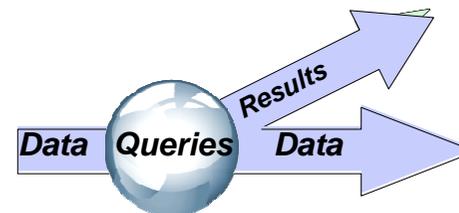
### Real time analysis of data-in-motion

#### Streaming data

A stream of structured or unstructured data-in-motion

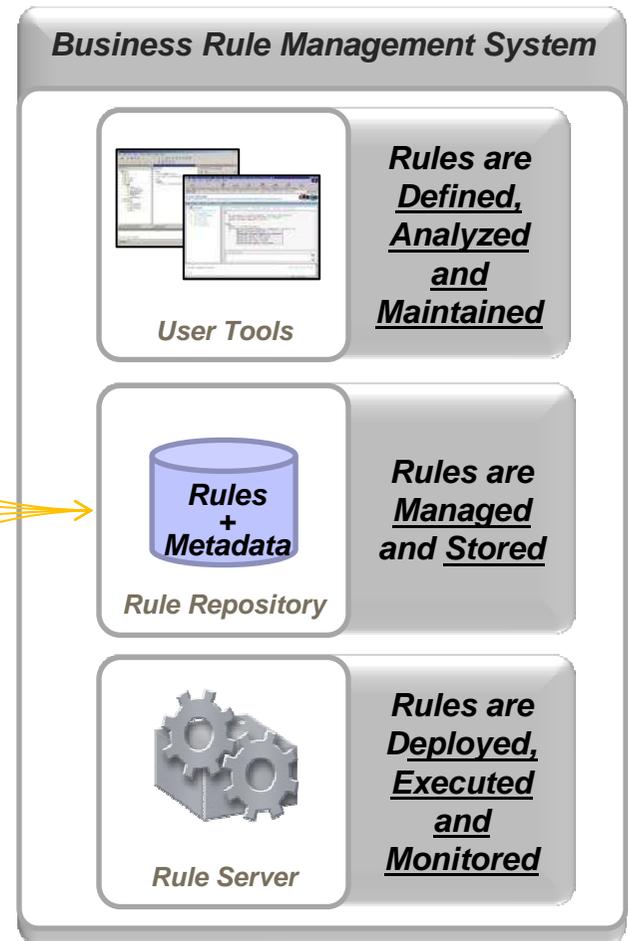
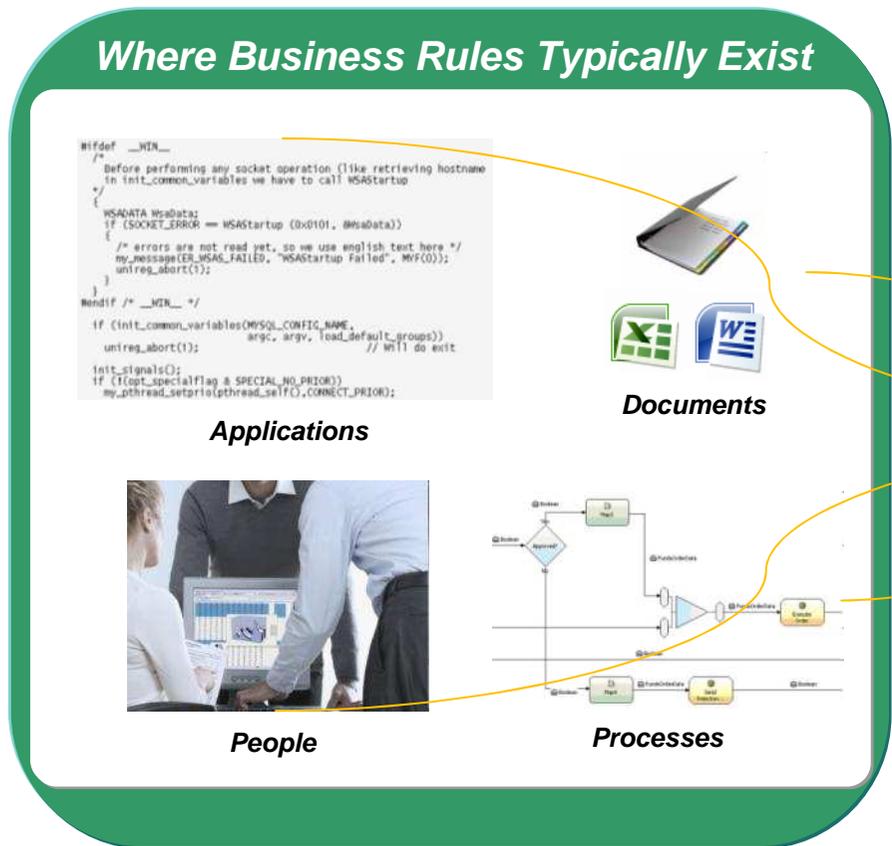
#### Stream Computing

Analytic operations on streaming data in real-time -- operations "fire" as data passes, unneeded data can be immediately discarded



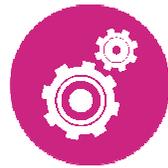


# BAO capabilities (6): acting on insight: business rules/processes to enable (semi) automated decisions





## Business Analytics for banking – relevancy in some focus areas



Operational efficiency



Integrated risk management



Customer care and insight



Payments and securities

SKIP



# Operational efficiency

- Deliver trusted information to improve productivity, implement new processes and automate existing processes
- Create trusted enterprise insight to drive business optimization
- Use analytics to understand performance and drive strategies that improve operations and financial results
- Optimize and truncate content-centric processes to reduce costs and improve the customer experience

SKIP



## Examples of BAO for operational efficiency

- **IT cost transparency**
  - Accelerators enable conversation between IT and departmental owners
  - Reports, dashboards and metrics show technology costing and chargeback, driver-based planning and forecasting and the service catalog
  - Advanced analytics give new view of technology services, cost of delivery and service levels
- **Branch performance**
  - Top-down and bottom-up branch planning helps ensure alignment with strategic objectives
  - Analysis by product and customer segments using activity-based drivers and rates helps manage branch profitability planning
- **Banking operations executive dashboard**
  - Accelerators provide an executive view of operations for a multiservice bank
  - Dashboards and scorecards present comprehensive visualization of data



SKIP



# Integrated risk management

- Integrate finance and risk data
- Communicate risk insight to decision makers throughout the organization
- Deliver timely, accurate information to optimize risk processes and management
- Use information to accurately identify and mitigate fraud and operational risk
- Help you address regulatory requirements such as scenario analysis, liquidity risk and Basel II

SKIP



## Examples of BAO for integrated risk management

- **Finance and Integrated Risk Management (FIRM)**

- Comprehensive enterprise risk management platform covers credit, operational, marketplace, counterparty, and financial risk and scenario analysis

- **Risk scenario analytics**

- “What if” risk scenario analytics predicts trade book marketplace risk, credit risk and capital

- **Liquidity risk**

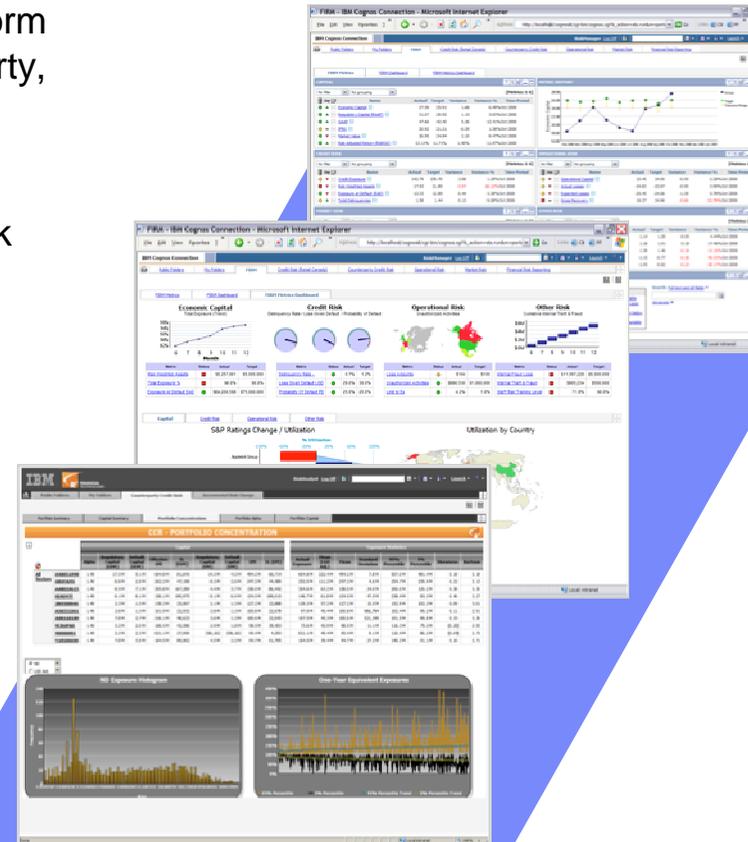
- Liquidity data model and stress testing supports in-house analysis, presentation and disclosure

- **Banking risk – credit risk application**

- Credit risk management reporting application monitors credit risk from origination to collections

- **Risk adjusted profitability**

- Integrated risk management and financial planning capability helps maximize risk adjusted return on capital (RAROC) for risk-based profitability management





# Customer care and insight

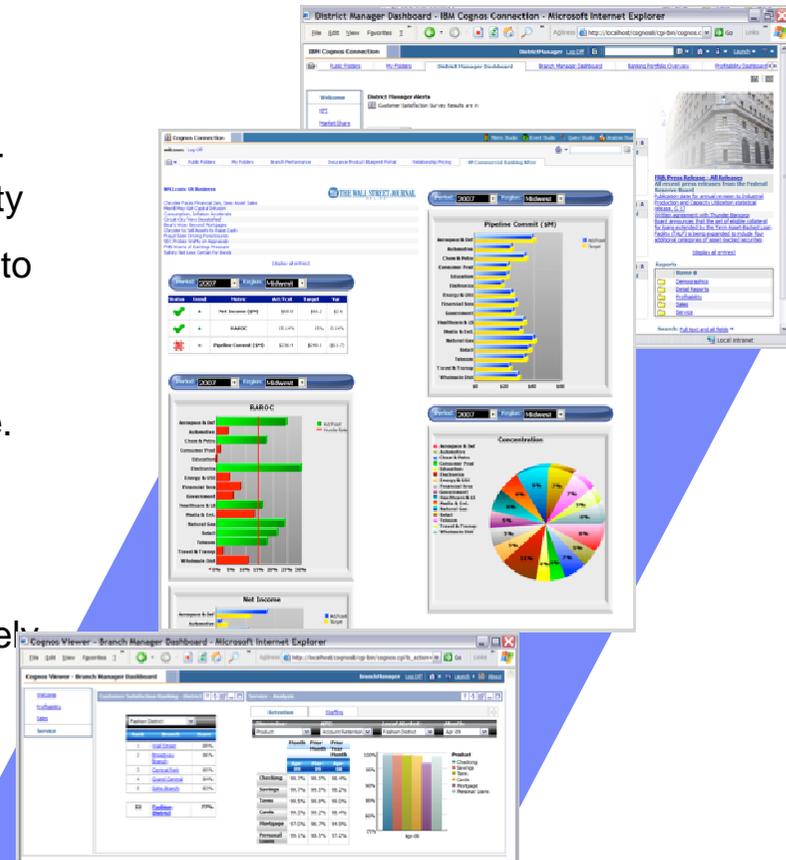
- Derive insight about customer segments and behavior to fuel organic growth through improved retention and leveraging cross-sell and up-sell opportunities
- Create a single view of the customer to provide a smooth and relevant cross-channel banking experience
- Put trusted information in the hands of frontline employees to improve productivity and customer service
- Employ information to enhance the banking experience across channels

SKIP



## Examples of BAO for customer care and insight (1)

- **Customer profitability analytics**
  - Increased profitable growth of customer base by 15%-20% by measuring and identifying customer profitability
  - Reduced servicing costs by using predictive analytics to focus attention on most profitable customers
  - Create an ideal customer profile using lifetime value models - and migrate existing customers to this profile.
- **Banking campaign insight and optimization**
  - Reduce costs and increase effectiveness of lead generation activities
  - Target offers to key customer segments more effectively
- **Relationship pricing for commercial banking**
  - Pricing solution to support daily credit and noncredit pricing decisions to large and small business banking customers

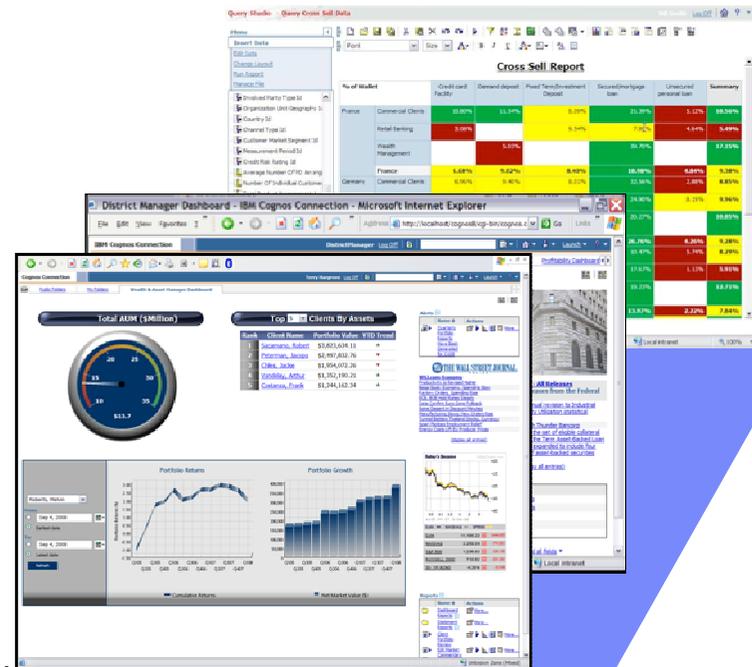


SKIP



## Examples of BAO for customer care and insight (2)

- **Client servicing blueprint**
  - Provides customer facing portal and self-service statement reporting
  - Includes internal wealth and asset management dashboards
- **Customer and product cross-sell**
  - Profitability and cross-sell analysis with data tied back to the IBM Banking Data Warehouse
- **Branch Performance**
  - Establishes corporate targets and develops integrated top down/ bottom up functional and operational plans.
  - Provides profitability planning and analysis by product and customer segment using activity-based drivers and rates.



SKIP



# Payments and securities

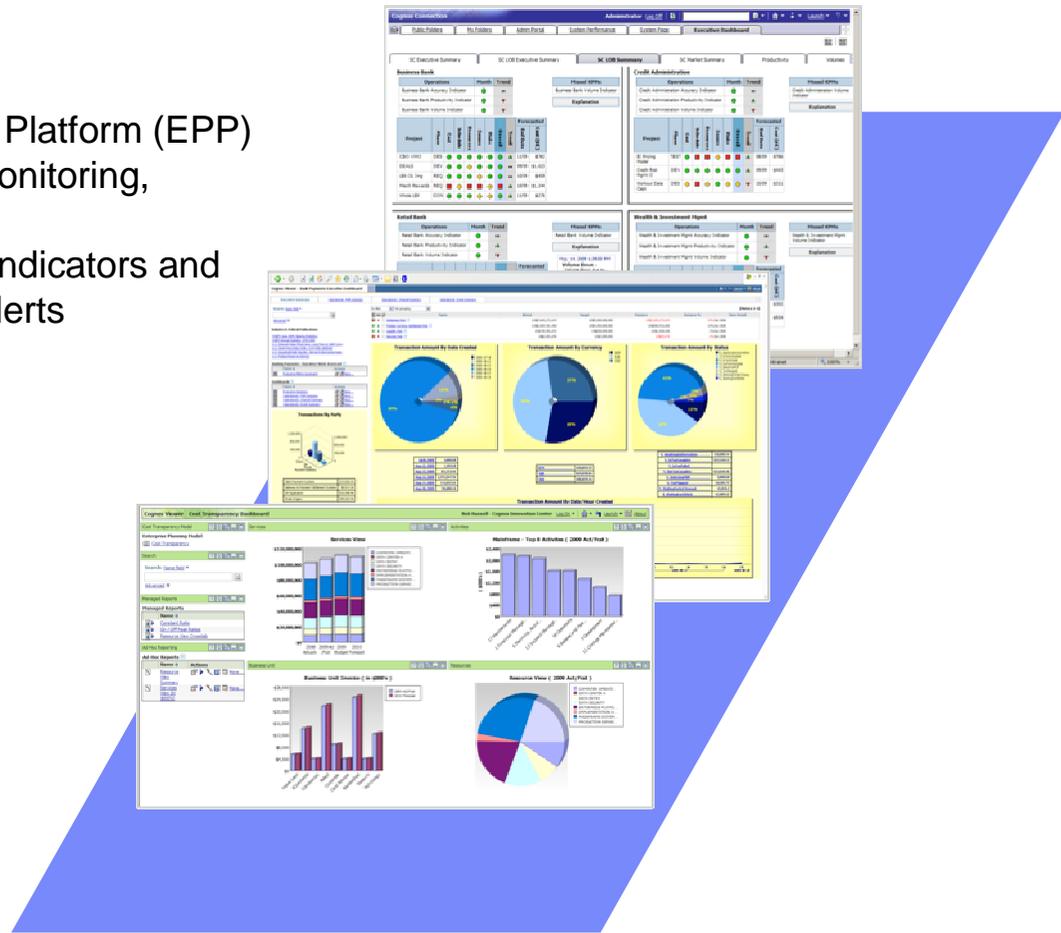
- Integrate solutions to help create a competitive edge for thorough renovating, consolidating and simplifying your company's payment environments
- Adopt a progressive approach to renovating the enterprise payments infrastructure
- Leverage "best-of-the-best" solution components from leading application providers
- Speed implementation with best practices and payment-specific solution accelerators
- Lower near-term cost, shorten time to value and reduce transformation risk

SKIP



# Example of BAO for payments and securities

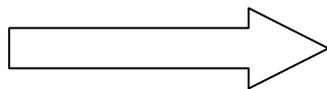
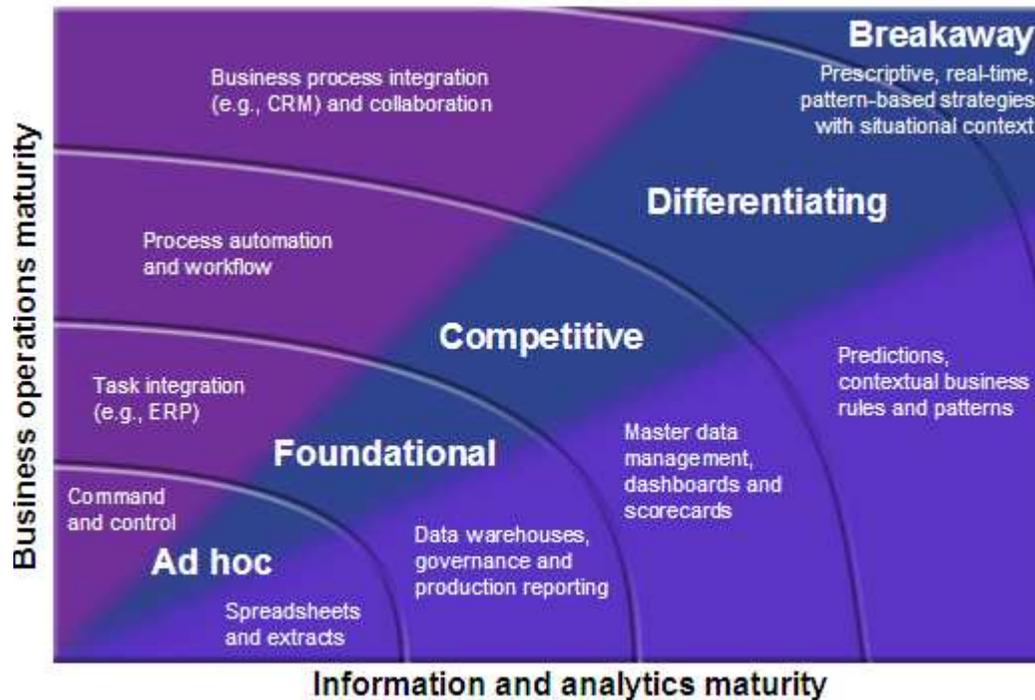
- **Enterprise payments monitoring**
  - leverages the IBM Enterprise Payments Platform (EPP) for comprehensive payments process monitoring, reporting and analysis
  - Includes dashboards, key performance indicators and scorecards, monitoring, reporting, and alerts



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# Business Analytics Maturity Model (reminder)

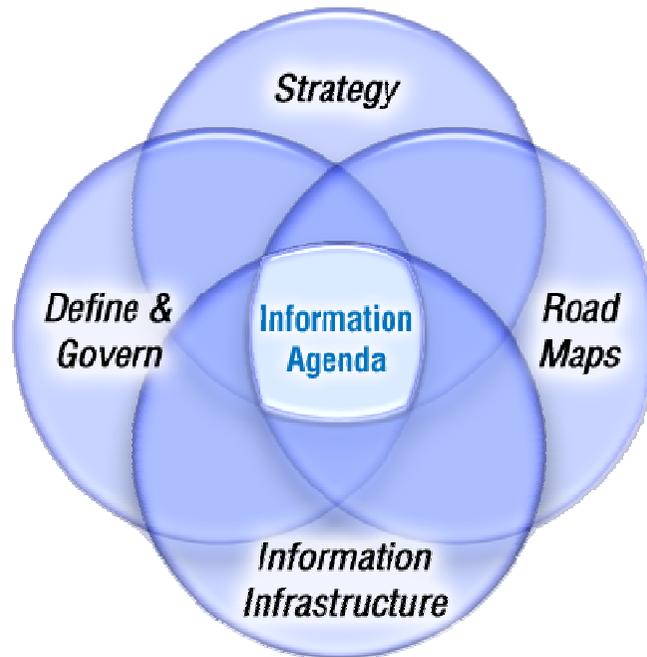


How can the bank move up to the next levels?



# Information Agenda - a proven approach to becoming an information based enterprise

*Creating a vision to guide decisions & align with business priorities*



*Establishing a plan for executing discrete projects to realize short and long-term returns on investment*

*Implementing cross line of business policies & practices for managing, using, improving & protecting information*

*Deploy open and agile technology and leverage existing information assets for speed and flexibility...*



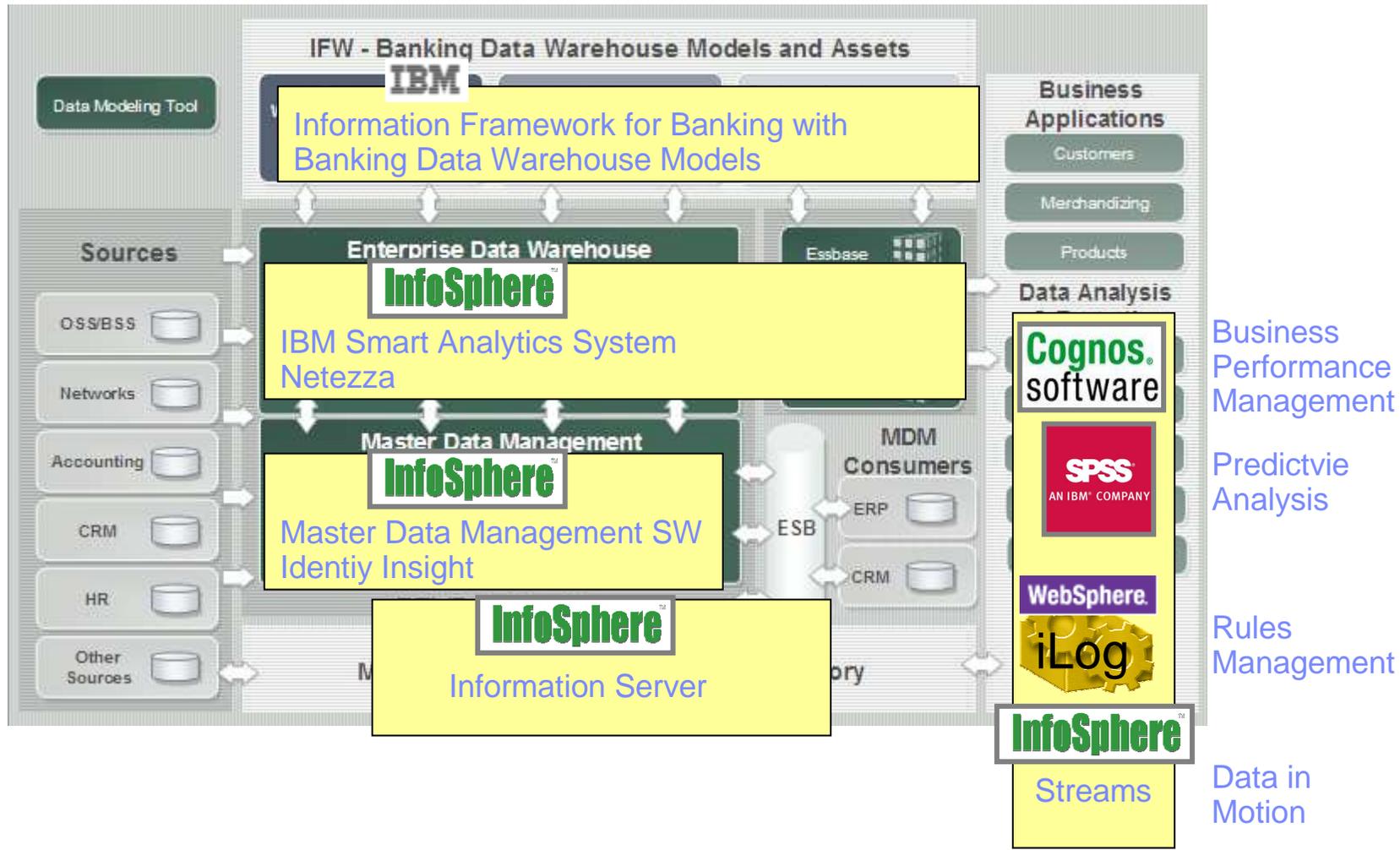
## Information Agenda Team

*An initiative from IBM to provide industry consultants, solution architects and business value consultants that can help banks accelerate efforts to establish more accurate, timely data, generate increased insight and leverage that information to support the strategic imperatives of their business.*

<b>Information Agenda Briefing</b>	<i>Provide an overview of the Information Agenda as well as how it can be applied to your industry and business projects. Share experiences and ideas about how other companies in your industry have driven increased business value through the use of information.</i>
<b>Information Agenda Roadmap Workshop</b>	<i>Identify, validate and prioritize areas where information and information technology can be used to support key business initiatives and drive business improvement. Develop a POV on the architecture needed to support the initiatives and current gaps. Build a vision and high level roadmap that identifies potential projects that will provide both short-term &amp; long-term returns on investment.</i>
<b>IA Solution Workshop</b>	<i>Architect a targeted solution, developing a proposed scope, technical architecture, project plan and timeframe. Provide a detailed business value assessment, including TCO and ROI.</i>



# IBM technology portfolio (excerpt) for BAO for banking





One - out of many - solution scenarios

## Enterprise Payments Platform - Cognos integration

Built on IBM's Enterprise Payments Platform (EPP) solution

**Housed in IBM Solution Center within La Gaude (France)**

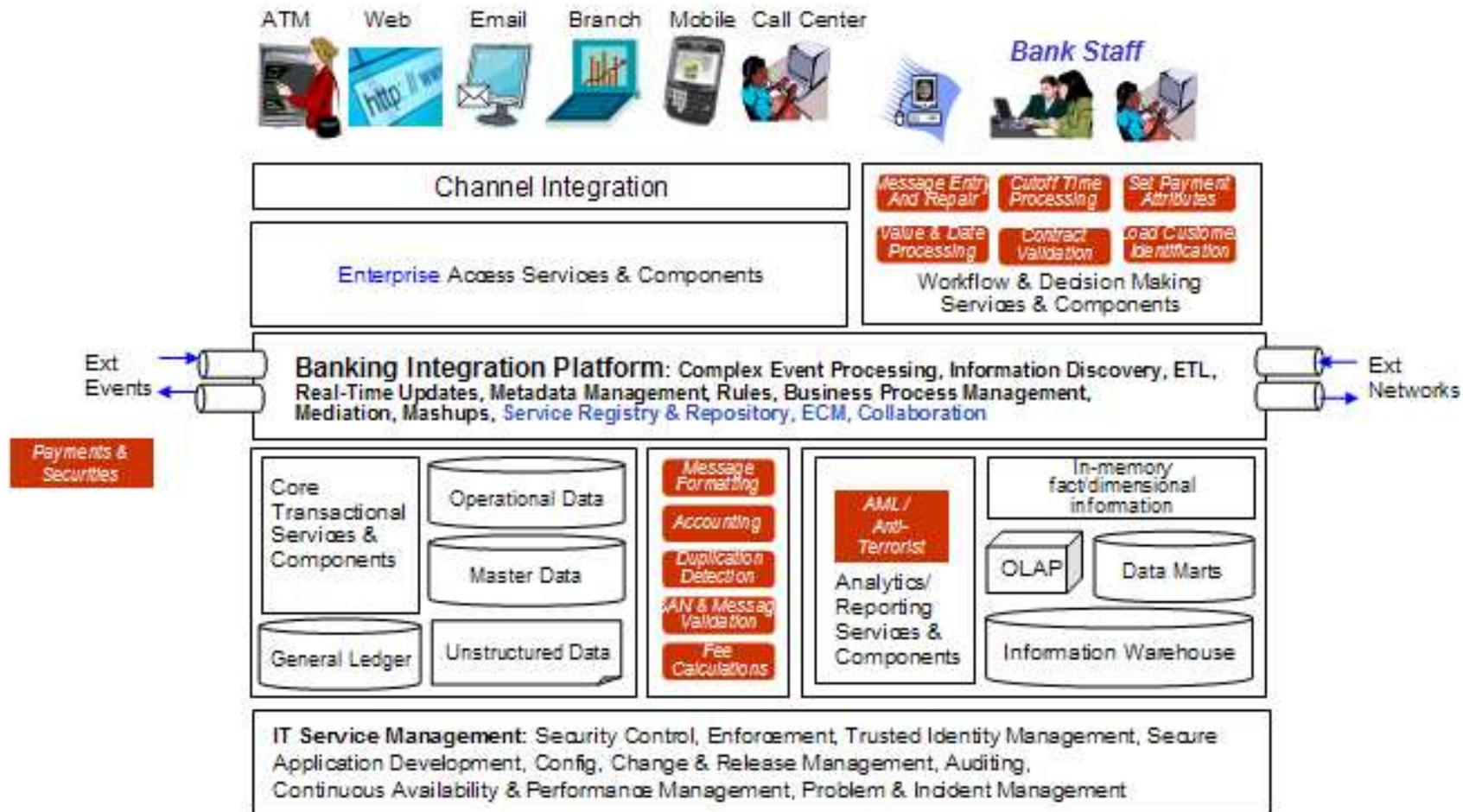
Functionality includes:

- Payments Dashboards
- Payments KPIs / Scorecards
- Payments Monitoring
- Payments reporting
- Payments Alerts

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# Solution architecture



SKIP



# Screenshot: payments monitoring

**Cognos Viewer - Bank Payments Executive Dashboard**

Executive Summary | Operational - FSM Summary | Operational - Channel Summary | Operational - Event Summary

Search: Name field

Advanced

**Industry & Federal Publications**

- CHAPS June 2009 Clearing Statistics
- CHIPS Annual Statistics 1970-2009
- U.S. Interest Rates Short-term, Long-Term & Yield Curve
- U.S. Stock Price Index D3IA, S & P 500, NASDAQ
- U.S. Household Debt Burden, Service & Borrowing Rates
- U.S. Federal Reserve Districts

**Banking Payments - Executive Metric Scorecard**

Name	Actions
Executive Metric Scorecard	More...

**Dashboards**

Name	Actions
Executive Summary	More...
Operational - FSM Summary	More...
Operational - Channel Summary	More...
Operational - Event Summary	More...

**Transactions By Party**

Client	ISV	JRules	Payment Gateway
Client Payment Systems	223,520.34		
Gateway to Payment Settlement Systems	58,513.26		
ISV Application	810,048.96		
JRules Engine	405,024.48		

**Transaction Amount vs. Transaction Count**

**Transaction Amount By Date Created**

Date	Amount
Jul 8, 2009	3,000.68
Aug 12, 2009	1,503.68
Aug 13, 2009	61,513.94
Aug 14, 2009	1,251,047.94
Aug 17, 2009	144,032.64
Aug 18, 2009	36,008.16

**Transaction Amount By Currency**

Currency	Amount
DEM	420,031.22
EUR	669,050.66
USD	408,025.16

**Transaction Amount By Status**

Status	Amount
S_AwaitingAuthorization	150,000.34
S_InTxnComplete	622,540.12
S_InTxnFailed	
S_OutTxnComplete	624,040.46
S_SelectingMOP	3,000.68
S_TxnMapped	10,505.72
S_WaitingForAckTimeout	45,010.2
S_WaitingForGWack	42,009.52

**Transaction Amount By Date/Hour Created**

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## Summary: Banks are becoming smarter with Business Analytics

### **Banking needs and priorities**

- Business analytics, risk & compliance

### **Analytics maturity model**

- From awareness to breakaway levels

### **(Advanced) business analytics and optimization capabilities**

- Business analysis and reporting, predictive analysis, realtime analytics, acting upon insight

### **Analytic applications in banking**

- Best practice–based industry solutions and accelerators

### **Information Agenda**

- Define the transition to becoming an information based enterprise

### **IBM Software**

- BAO software portfolio and assets for banking



***Muṭumesc.***

IBM