

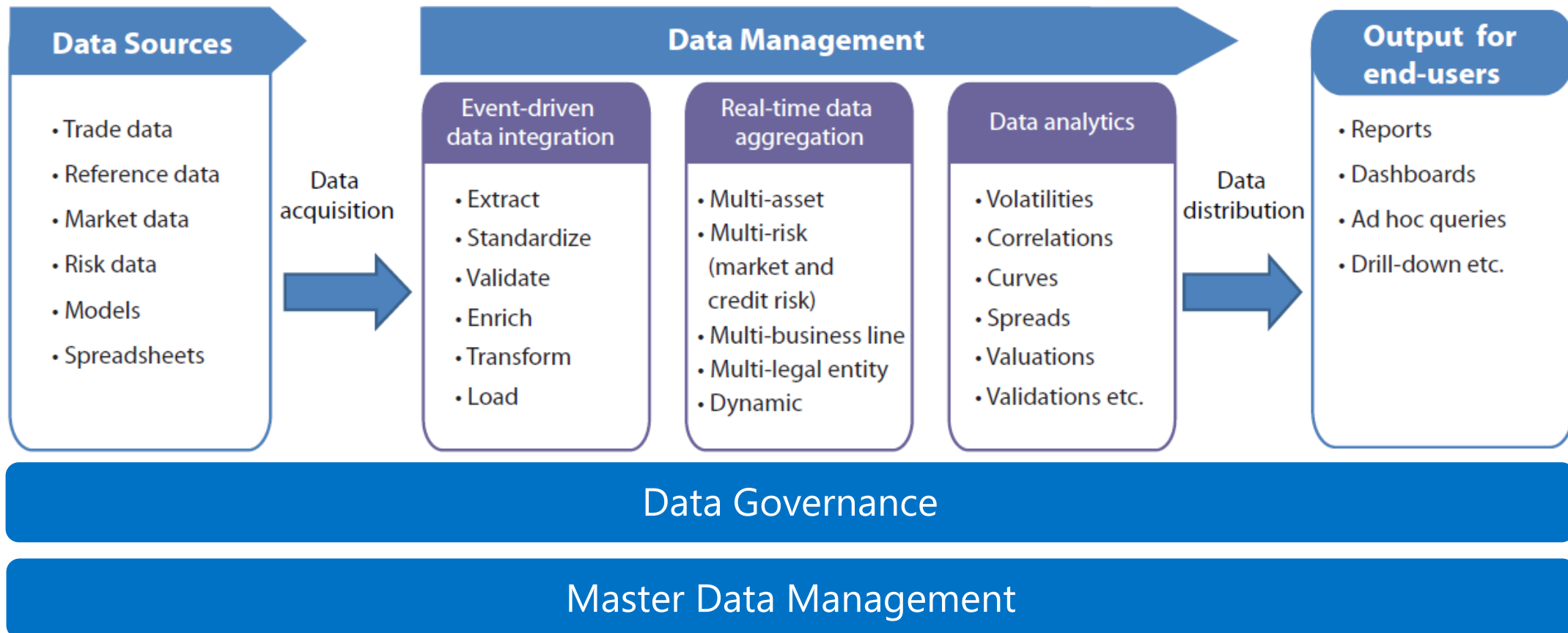
Risk Management on Azure

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Industry Solutions



Challenges Impacting Risk & Reg Compliance

DUPLICATE, EXPENSIVE DATA Several Data providers and sources, differ by region, asset class, venues served	NON STANDARD DELIVERY Delivered via hosted solution, direct feed, exchange tapes, manual uploads	NON STANDARD ETL Leveraging outsourcers, consultants or in-house staff with custom processes	SILOED INFORMATION Departmental sourcing leads to need to aggregate across business lines that is time consuming	CUSTOM ANALYTICS Differing models for sometimes homogeneous needs leads to different versions of the truth	CENTRALLY MANAGED Business units need to make request for data from IT/Ops for their analytics needs leading to delays in time to value	DISPARATE TOOLS Multiple applications, ad-hoc tools lead to poor collaboration, updation and inconsistency from trading to accounting
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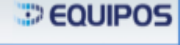





















Microsoft Approach for Risk and Reg Compliance on Azure

DT Journey

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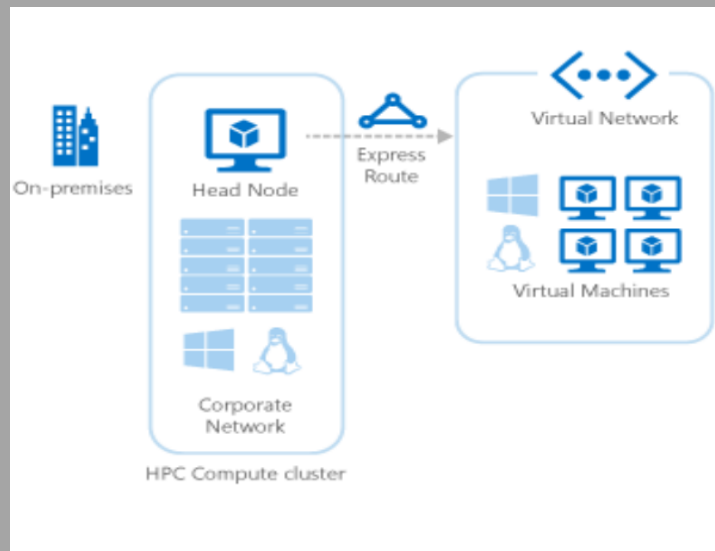
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		Process	Microsoft Products	Partner Solutions
7	Regulatory submissions & reports	 Consumption Experiences	Power BI, O365	 
6	Aggregation, analysis & MI	 Data Visualization	Power BI	  
5	Projections & forecasting	 Data Analysis	Power BI, Azure ML	   
4	Stress testing information repository	 Data Modelling	Power Pivot	 
3	Governance & development lifecycle layer	 Data Discovery & ETL	SQL, Azure, Datalake	 
2	Data extraction, transformation & validation	 Data Warehouse	SQL, SQL Azure,	
1	Source systems, tools & data	 Data Compute	Azure, Azure Stack	  

Risk Compute

A Cloud based high performance computing solution enabling financial institutions to deploy and manage grids for risk and related compute needs in a flexible, secure manner, at your terms with an optimal TCO



Reduce Regulatory Complexity

Manage Business risk more effectively

Uncover new Monetization opportunities



Main Use Cases for Grid Compute in the Cloud

Market Risk/VAR/FRTB

Credit Risk – Credit Value
Adjustment (CVA) and
Potential Future Exposure
(PFE)

GaaS – Grid as a service

Risk as a Service

Back-testing trading
models/hedging strategies
and other algorithmic needs

Investment valuation

Batch/EOD Compute

Portfolio Analysis &
Reporting

Lending/Scoring
Portfolio

UBS

Moving risk management to the cloud to cut costs while improving calculation speed

Challenge UBS wanted to enhance its risk management capabilities and meet current and future compliance regulations

Solution UBS moved its on-premise risk-management platform to the Azure cloud

Benefits

- Risk calculation time sped up by 100%, enabling employees to make quicker decisions to mitigate risk
- Microsoft's Financial Services Compliance program provided transparency to ensure data is properly secured and meets all regulations
- Infrastructure costs were reduced by 40%, giving UBC more working capital



▶ Watch



"With Microsoft Azure, we are building on the industry's leading cloud platform in terms of innovation, technology, security and regulatory compliance, which is very important as a Swiss financial institution."

– Paul McEwen

Group Head of Technology Services, UBS

Murex certifies MX.3 to run on Microsoft Azure

October 17
2017

Murex has certified its MX.3 technology platform to run on Microsoft Azure. Microsoft and Murex have been collaborating since early 2016 in digital market solutions, and it has the integration of Microsoft SQL Server 2016 as a relational database for MX.3 in the pipeline.

Murex has certified Azure for its most computer-intensive use cases including GPU-powered solutions. This will allow those making the leap to cloud to leverage its flexibility and economies of scale to meet new requirements.

In an interview with IBS Intelligence during Sibos, Stella Clarke, CMO at Murex, highlighted the importance of cloud. "Almost every single one of our customers is either moving to cloud, or considering ways to do it," she said. She added that it's full of advantages, including better cost-effectiveness in most cases, and flexibility.



Cloud Benefits

Provisioning revolution

Always state-of-the-art

Billing transparency



Always state-of-the-art

Cloud infrastructure is constantly upgraded and enriched, allowing you to benefit from the latest technology and innovations with no disruption to your daily operations. Cloud is setting standards across all industries and is enabling advances in other areas, from DevOps to security. Murex clients using cloud will have a fully digital experience for deployment, consumption metering and billing.



Murex Lift & Shift into the Cloud: Full or Hybrid Cloud Patterns

Production

Development and test

Grid computing

Disaster recovery

Development and test

Provisioning of development and test environments is reduced from months to minutes, eliminating time spent on procurement, deployment and management. Environments can be added or deleted quickly, allowing you to manage concurrent projects and evolve the platform. With experience replicating environments on the cloud internally, Murex can help you do the same.



Murex cloud support

Benefit from our experience. Whether you are at the beginning of your cloud journey and are looking for advice or are ready to migrate to the cloud, Murex offers leading support at every step of your cloud journey.

AXIOMA: POWERED BY MICROSOFT AZURE

We compute daily analytics on thousands of complex portfolios. Globally, we're one of the top 20 users of Microsoft cloud computing power.

Axioma was a cloud pioneer, so you don't have to be.

We have a long partnership with Azure. Together, Axioma and Microsoft explored how cloud solutions could benefit financial services firms. Along the way, we've enhanced our solutions and are helping our joint clients by sharing our expertise.

Azure meets the security standards of our clients, some of the world's most private firms.

Microsoft sets the gold standard in cloud security, and we've created solutions, such as a client-owned encryption methodology, for clients who want the utmost control over their sensitive data.

“Axioma is creating a lower cost, faster infrastructure that is in demand by a growing segment of their clients.”

Celent Research, *Cloud-Enabled Governance, Risk and Compliance Solutions*, Oct. 2017

SOLUTION BENEFITS

Axioma offers portfolio & risk management solutions that enable timely, comparable views of risk across all asset classes.

Multiple Risk Methodologies

Serve front and middle office without compromise. Eliminate the need for multiple risk systems.

API-first Architecture

Rapidly develop and platform in-house or 3rd party solutions using services/ an API-first approach.

Modular Consumption

Consume risk models, portfolio optimization capabilities, monitors, exposures, pricing services etc., only as required.

Next-gen Analytics

Our modern infrastructure enables next gen risk analytics, such as portfolio aging strategies & stress tests.

“Axioma’s modular cloud-based platform was clearly the best solution to help HedgeMark deliver detailed risk analysis on global, multi asset-class portfolios for our clients.”

Andrew Lapkin, CEO, HedgeMark

Microsoft AppSource



One destination for business users to discover, trial, and acquire line-of-business SaaS apps



Simplifies the discovery,
trial, and acquisition of
line-of-business apps



An ecosystem to help
business users get started
using apps faster



Helps business users do
more with their existing
Microsoft Apps

Get ready now with one of the first FRTB solutions

A cutting-edge SaaS solution that delivers...

A **tangible product** that's available now

- Implement the solution and get on the path toward FRTB compliance
- Stop waiting for vaporware solutions that might not pull through in time



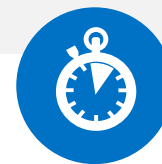
Rapid deployment with a SaaS solution

- Accelerate implementation and FRTB-readiness with a cloud-based approach
- Roll-out easier than in-house builds or other vendor products



The **fastest calculations** in the industry

- Perform calculations in minutes instead of hours
- Scale infinitely with the cloud
- Improve calculation speeds 80x with a vectorized approach



Proven analytics and pricing models

- Use industry-leading derivative pricing models to match any front office models
- Help trading desks pass P&L attribution tests to achieve IMA approval
- Support either IMA or SA calculations with robust risk models



A modern risk platform provides...



Limitless,
cost-effective scalability



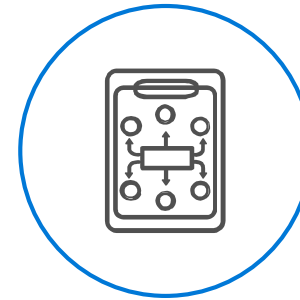
Transparent,
auditable processes



Accelerated development
of a strategic risk platform



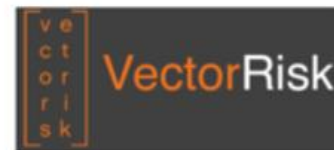
Future-proof system
maintenance



Freedom to
innovate

Thank You

Sample Azure Financial Services Industry Partners



Trusted by industry leaders worldwide



> 90%

of the Fortune 500 protected with Microsoft Enterprise Security

> 85%

of Global "Too Big to Fail" Financial Institutions (G-SIFs) are Azure customers

25

Global "Too Big to Fail" G-SIFs have signed Azure's G-SIFI production cloud terms



"The cloud is inevitable...
But right now the timing
isn't right."

FIVE YEARS AGO...

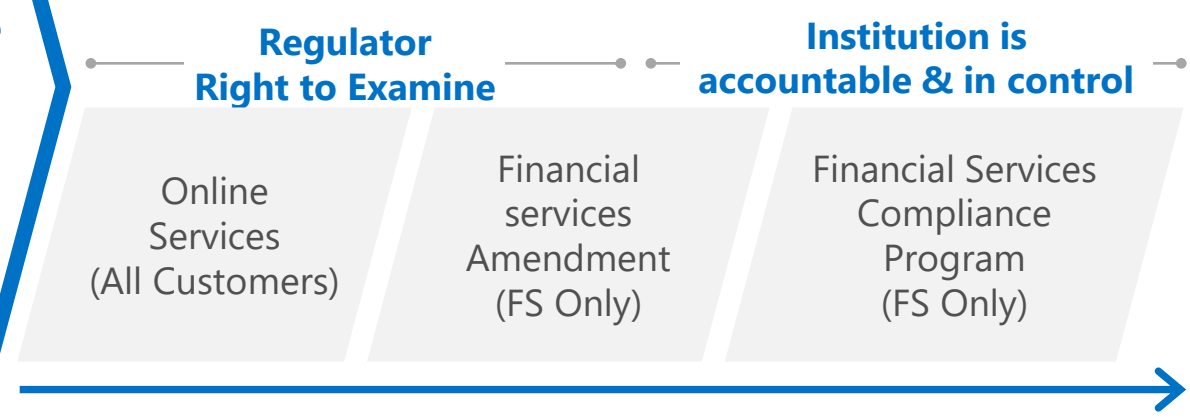


"Tell me how to get
there in a safe &
regulatory
compliant way..."

TODAY...

Leading edge
regulatory compliance
capabilities
empowering
financial services

Over 120 financial services regulators
engaged in last 5 years



Today, over
90% of the G-SIFI financial institutions
are now using the Microsoft Cloud...