



Operational Risk Assessment using AMA Framework 1Q 2024 Project Lab

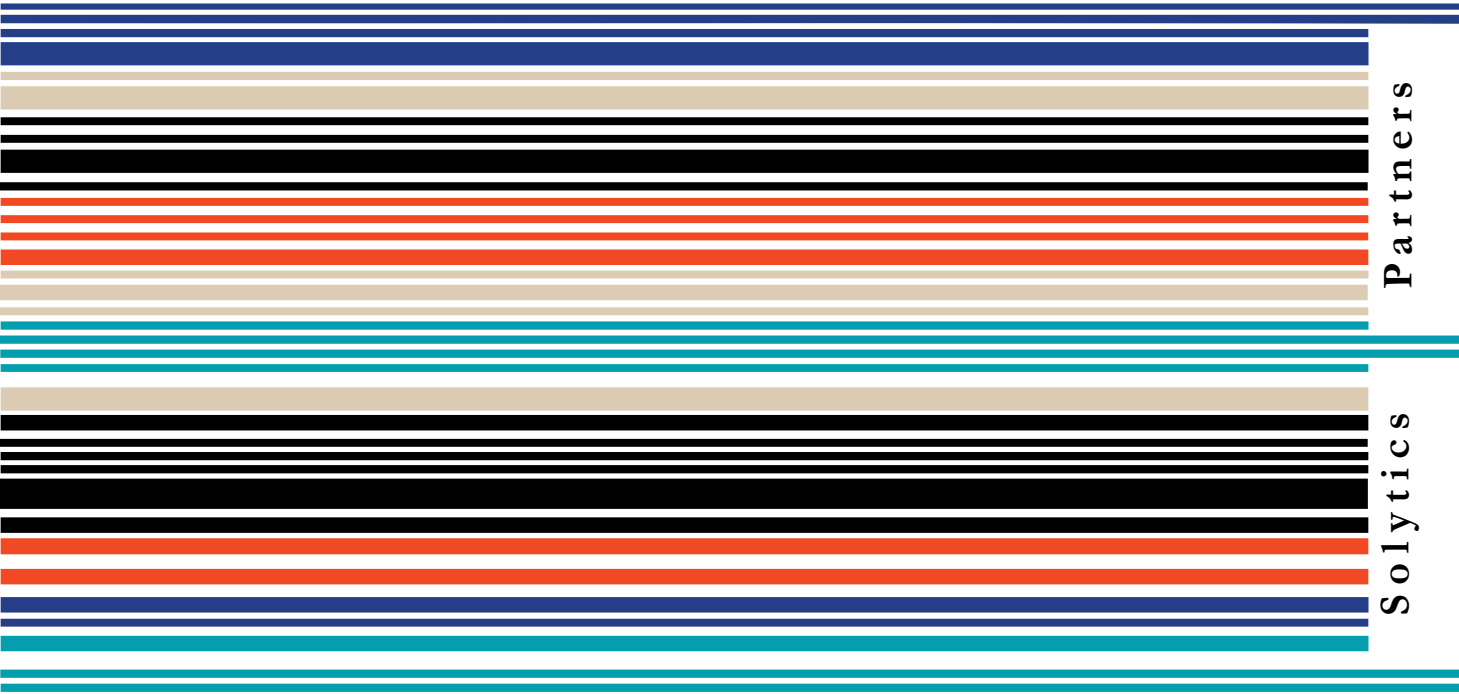
Presentation to UChicago

Meeting Date: January 3rd, 2024

File version: 1/3/2024

2024





About Solytics Partners and the Project Mentor

Scan the QR to get more information



Alberto M. Ramirez, FCA, MAAA
Partner



Amir Kasim Pathan, M.Tech.
Associate Consultant

Solytics Partners is a Global Analytics Firm focused on solving unique client problems through an amalgamation of advanced analytics, new-age technologies, and deep domain expertise. Our team comes with decades of experience of working with major financial institutions and corporations in the areas of Risk, Compliance, and Business Analytics. We are currently leveraging Machine Learning, Data Science, and Cloud infrastructure to transform existing processes and services delivery. Our operations are based out of Argentina, India, UAE, UK, and US

- Former President of Colegio Actuarial Mexicano
- Member of the American Academy of Actuaries (AAA)
- Fellow of the Conference of Consulting Actuaries (CCA)
- Member of the Emerging Leaders Committee of the CCA
- Member of the Actuarial Advisory Board of the Actuarial Sciences Program at Roosevelt University
- Regular project mentor at the University of Chicago, University of Illinois and Roosevelt University

- PhD Candidate (Statistics) at Symbiosis International University
- Master's in Mathematical Modeling & Simulation
- Research Fellow for DST-ICIMPACT (India-Canada joint initiative, 2021-22)
- Research Fellow at Centre for Modeling and Simulation, Savitribai Phule Pune University (2019-2021)

Problem Statement

You are a COO and need to perform an operational risk assessment in adherence with AMA using Jupyter Notebooks

Building blocks	Description
I. Business Context	<ul style="list-style-type: none">In the regulatory landscape of Basel II and Basel III, a European bank prioritizes financial stability, regulatory compliance, and proactive operational risk management. Implementing the Advanced Measurement Approach (AMA), the bank seeks to define and monitor key operational risk indicators, leveraging historical data for data-driven decision-making. The objective is to calculate Expected Loss (EL), Unexpected Loss (UL), and regulatory capital requirements for effective capital allocation. Beyond compliance, the initiative aims to instill stakeholder confidence, foster continual improvement, and promote cross-functional collaboration for holistic operational risk management, aligning with broader goals of resilience and transparency.
II. Problem Statement	<ul style="list-style-type: none">As a leading European bank, ensuring robust risk management practices is critical to maintaining financial stability, regulatory compliance, and safeguarding the interests of stakeholders. Operational risk, stemming from internal processes, systems, people, and external events, is a significant concern that requires a comprehensive approach for measurement and mitigation.The primary objective is to implement the Advanced Measurement Approach (AMA) to accurately calculate operational risk, thereby determining the necessary regulatory capital to cover potential unexpected losses. This initiative aligns with Basel II and Basel III regulatory frameworks, emphasizing the importance of banks adopting sophisticated internal models for operational risk assessment.
III. Assumptions	<ul style="list-style-type: none">In case variables or information is not provided, make reasonable assumptions but make note of the justificationsIn operational risk calculation with the Advanced Measurement Approach (AMA), key assumptions include accurate historical data, modeled operational losses, and assumptions about independence and stability. Choices for confidence level and regulatory multiplier align with regulations, and a conservative approach is taken for capital requirements. Regular validation is advised to assess the impact of these assumptions on risk calculations.

Project details and milestones

You have the following timeline to complete the problem statement

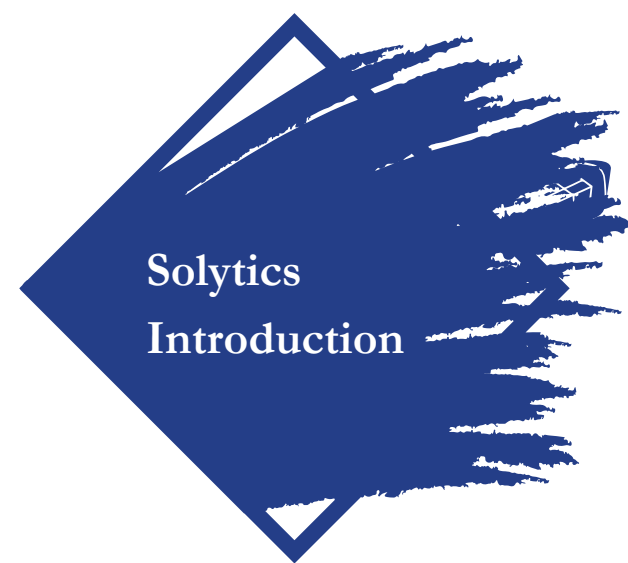
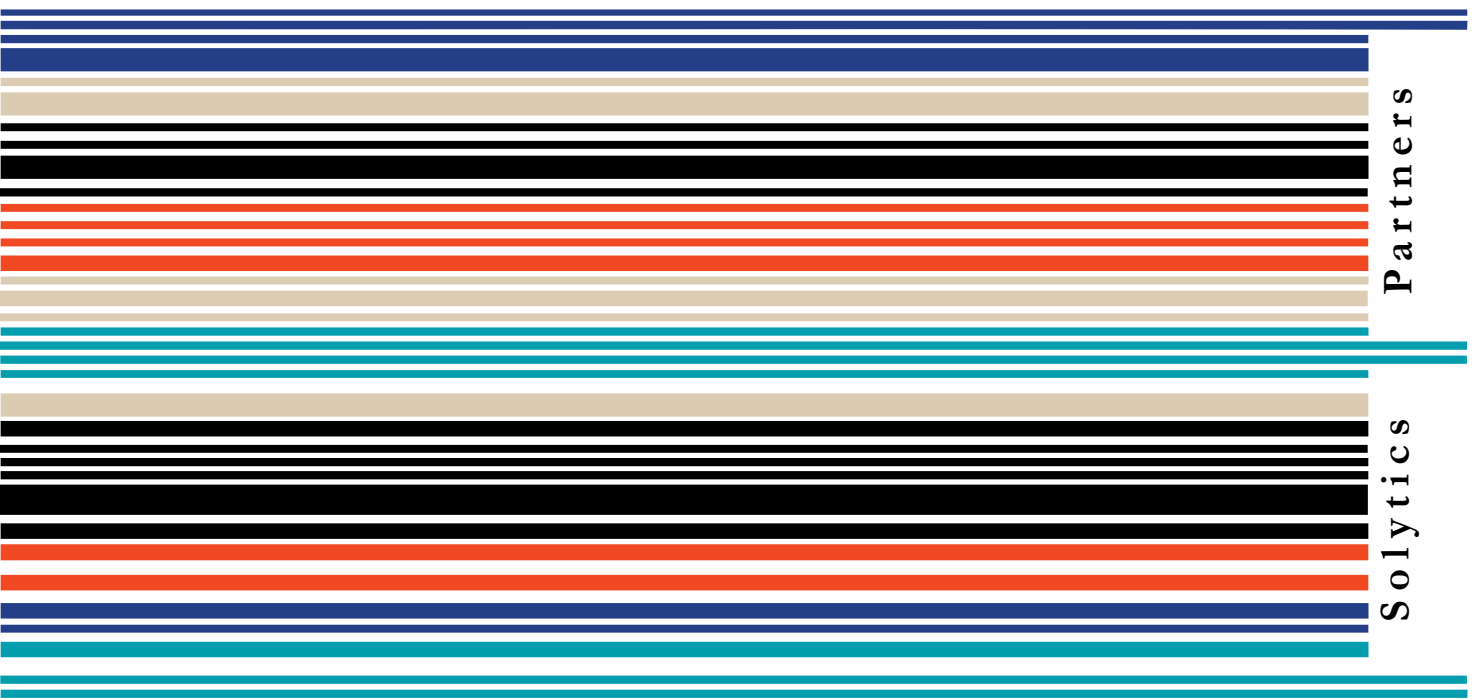
Building blocks	Timeline	Review and/or prepare the following milestones
1. Literature and Data Review	Week 1	<ul style="list-style-type: none"> • Mission Critical: Project Details Document, Project Data • Good to know: AMA framework, Basel I, Basel II, Operational Risk • Above and Beyond: Some regulatory guidelines on operational risk (publications by EBA, ECB, FCA, IOSSCO, FSB)
2. Model Development	Week 4	<ul style="list-style-type: none"> • Perform the required data analysis and drivers identification of your portfolio • Create a set of performance testing based standard statistics, include sensitivities and error analysis when feasible • Prepare a statistical model according to AMA and project lead requirements • Ask questions or inform about key findings or challenges
3. Results and Analysis	Week 6	<ul style="list-style-type: none"> • Use the proposed model to develop a report with relevant metrics or indicators based on AMA framework • Review and analyze the results based on the defined metrics • Ask questions or inform about key findings or challenges
4. Final report, codes, data and presentation	Week 8	<ul style="list-style-type: none"> • Prepare a summary report with the project details, methodology used and key results • Present the final results in a ppt format, no more than 10 slides including executive summary, key results, methodology, findings and business recommendations

Suggested self-questions for better analysis

Operational Risk Assessment using AMA Framework – Sample questions for your analysis

- 1. Effectiveness of AMA Framework:** To what extent does the implementation of the Advanced Measurement Approach (AMA) contribute to the effectiveness of operational risk management in European banks?
- 2. Impact of Model Assumptions:** How do key assumptions, such as the probability distribution assumptions for frequency and severity, impact the accuracy and reliability of operational risk models under the AMA?
- 3. Comparative Analysis of Risk Indicators:** What is the comparative analysis of different operational risk indicators (e.g., customer complaints, regulatory violations) in predicting and quantifying operational losses within the AMA framework?
- 4. Dynamic Nature of Operational Risk:** How does the AMA framework address the dynamic nature of operational risks, and what strategies can be employed to enhance adaptability to changing risk landscapes?
- 5. Validation and Calibration Processes:** What are the key challenges and best practices in the validation and calibration processes of AMA models, and how do these processes contribute to model robustness and accuracy?
- 6. Stakeholder Perception and Confidence:** How does the transparency and communication of operational risk calculations under the AMA influence stakeholder perception and confidence in the risk management practices of European banks?
- 7. Alignment with Regulatory Requirements:** To what extent does the operational risk calculation under the AMA align with regulatory requirements, and what areas may require further refinement to ensure compliance?
- 8. Cross-Functional Collaboration Impact:** How does cross-functional collaboration, involving departments such as risk management, compliance, and IT, impact the holistic operational risk management approach within the AMA framework?
- 9. Comparative Analysis with Standardized Approaches:** What are the advantages and limitations of the AMA framework in comparison to standardized approaches for operational risk calculation, and under what circumstances does one approach outperform the other?
- 10. Continuous Improvement Strategies:** What strategies can European banks adopt for the continuous improvement of their operational risk models and management processes within the AMA framework?

Addressing these key questions will provide a comprehensive understanding of the Advanced Measurement Approach (AMA) in European banks' operational risk management. Insights into model effectiveness, impact of assumptions, and comparative analyses of risk indicators would guide refinements, fostering adaptability to dynamic risks. Understanding stakeholder perception, regulatory alignment, and collaborative impact informs strategies for continuous improvement, ensuring the AMA framework contributes to resilient and compliant operational risk management practices.



Solytics Partners – Enabling FIs in the changed environment

Solytics Partners brings unique ecosystem of deep domain expertise, along with advanced analytics and new age technology to accelerate value creation across functions and processes in financial industry

Deep Domain Expertise

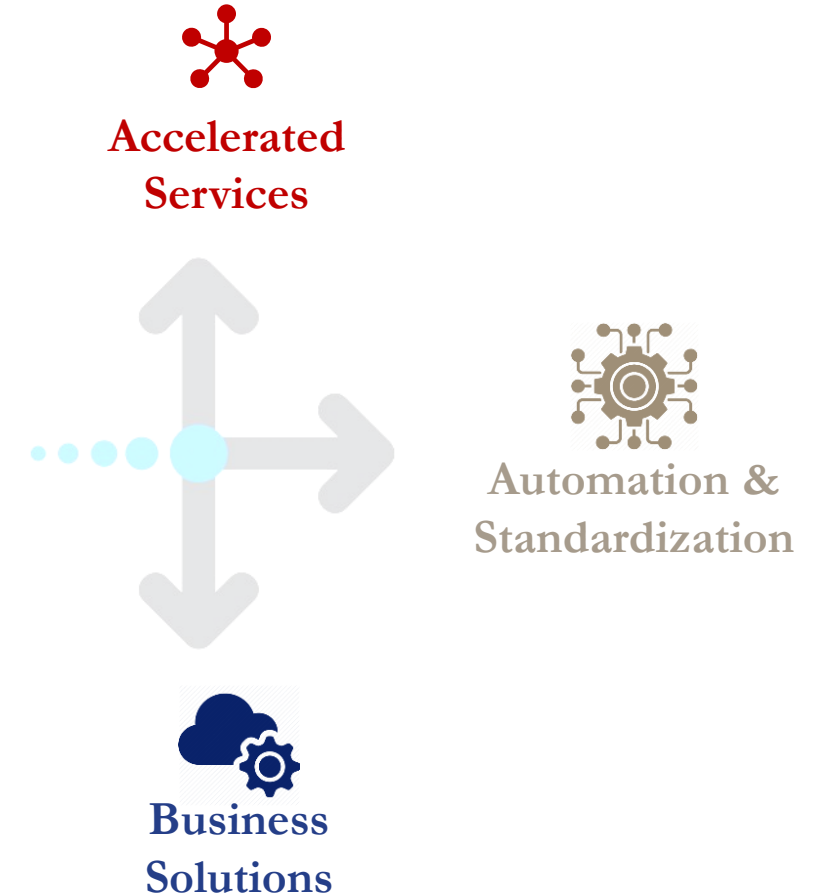
- Types of Risk: Credit, Market, Operational, Liquidity
- Regulatory Expectations
- Financial Crime & Compliance
- ESG: Climate Change & Risk Modelling

Analytics

- Mathematical & Statistical expertise
- Machine learning and NLP
- SAS, Python, R and other analytical tools
- Big data analytics

Technology

- Big Data Technologies – Hadoop, Hive, Kafka etc.
- Distributed computing & modelling – Spark, Scala
- Cloud-based technology – Azure, AWS and GCP
- Programming – .NET, C#, Java, Tableau etc.



Our Solutions



Compliance Analytics

ARC™ – Alert Review and Clearing

Supervised and unsupervised machine learning models that investigate alerts, derives false positives with high accuracy and significantly reduces human errors

SAMS™ – Sanctions and Adverse Media Screening

NLP/NLG based solution to address sanctions and negative news screening. Ability to de-duplicate and eliminate irrelevant information

ATOMS™ – Automated Tuning of Money Laundering Systems

Solution for tuning and validating the thresholds & scenarios for rule-based system. It has ability to evaluate thresholds using multiple methodology

EMoT™* – Enhanced Monitoring of Transactions

Comprehensive scenarios covering maximum risk products & business lines. Augmented by AI for pattern recognition and behavioural analytics. Ease of deployment and SaaS option.

🦋 * Expected to be released in Q4 2023



Risk Analytics

Nimbus Uno™

Automated Model Development Solution

Methodology-oriented approach for automated data analysis, model testing and analytics, monitoring and eventually leveraging NLP for automated documentation.

Automated Validation Solution

Follows SR 11-7, SS1/23 compliant approach for granularity of analytics, effective challenge, benchmarking and documentation

Automated Model Performance Solution

Provide easy to integrate solution to track model performance across all times series and classification Models, including machine learning, traditional models and emerging climate-change risk methodologies

MRM Vault™ – Model Inventory

Cloud Hosted Model Inventory and Governance solution

Our Services - Built on Accelerated Delivery Framework

Risk

- **Risk:** Market risk, Credit risk, Liquidity risk, Operational risk, Climate risk
- Pricing & Capital Markets: Pricing Models, Curve constnution, XVA, and vol surface & calibration
- Stress Testing + Climate: PPNR, Loss projection, balance sheet forecasting, Climate stress testing and scenario analysis
- **Regulations and guideliness:** CCAR, DFAST, EBA, PRA, ISSB/TCFD, etc.

Compliance

- KYC analytics
- Transaction monitoring & Alert clearing
- Threshold optimization
- Fraud detection
- System & process validations
- Customer segmentation and risk rating
- Negative news & sanctions screening

Data Analytics and Engineering

- Support through the whole data value chain
- Data Extraction, Ingestion, Integration and Visualization
- Predictive and Descriptive analytics
- Data as a Service

ML/NLP/NLG

- **Supervised:** Linear Regression, Logistic Regression, Decision Trees, Naive Bayes, kNN, K-Means, Random Forest, Gradient Boosting
- **Unsupervised:** Clustering, Anomaly detection, Neural Networks
- **NLP:** Named Entity Extraction, POS Tagging, CRF++, HMM Maxent, CKY algos and other chart parsing algorithms, SVM, Naive Bayes, LDA, LSI

Technology

- **Big Data Technologies** – Hadoop, Hive, Kafka etc.
- **Distributed computing and modelling** – Spark, Scala
- **Data-flow programming** – Tensorflow, Keras, Pytorch, Fast.AI
- **Cloud-based technology** – Azure, AWS and Google cloud
- **Deployment technologies** – Docker, Microservices, API based deployment
- Structured and no-SQL databases

- **Model Development, Testing & Documentation**
- **Model Validation, Annual Reviews**
- **Ongoing performance monitoring & review**
- **Model governance frameworks**
- **Analytical Process Support**

Risk and Compliance



Our Utilities

Squall

Data Parser

Nimble

Linguistic Analytics

Penguin

Data Analyzer

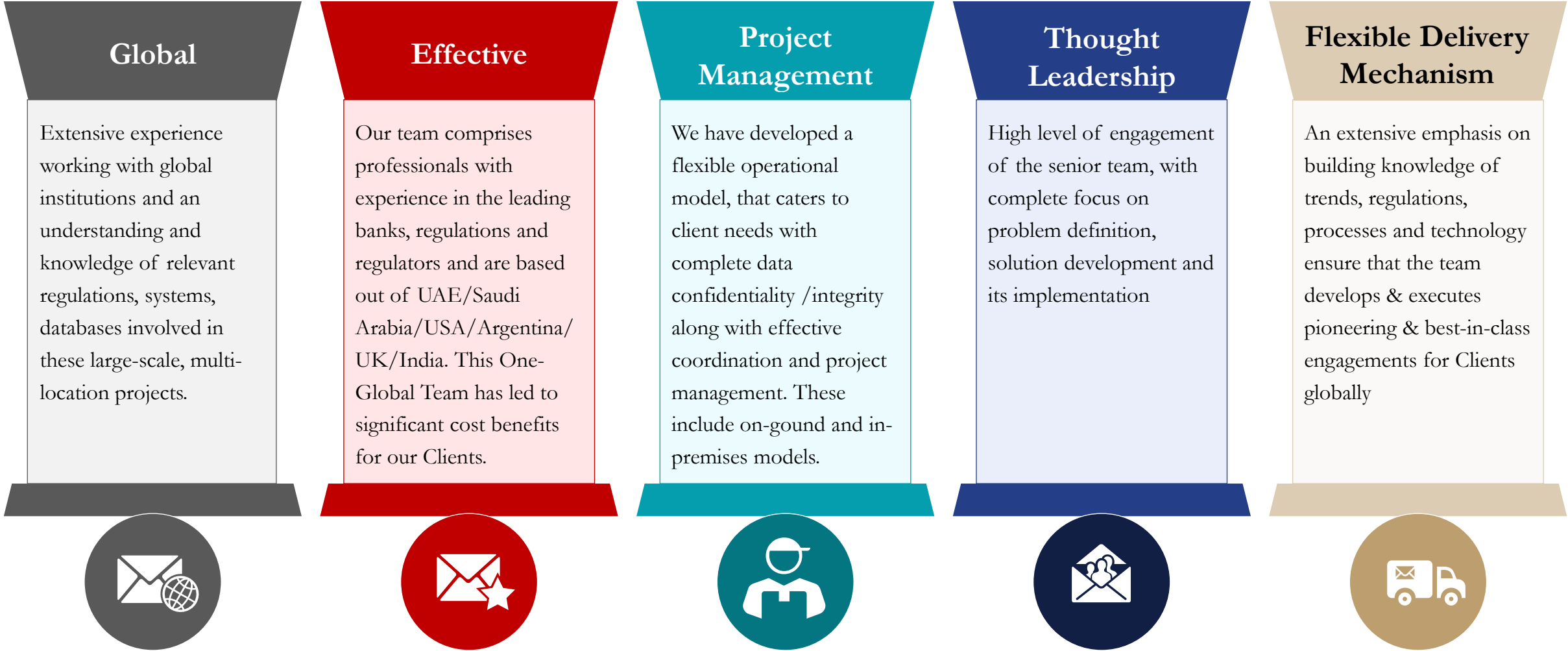
Aqua

Modeling Suite

Triad

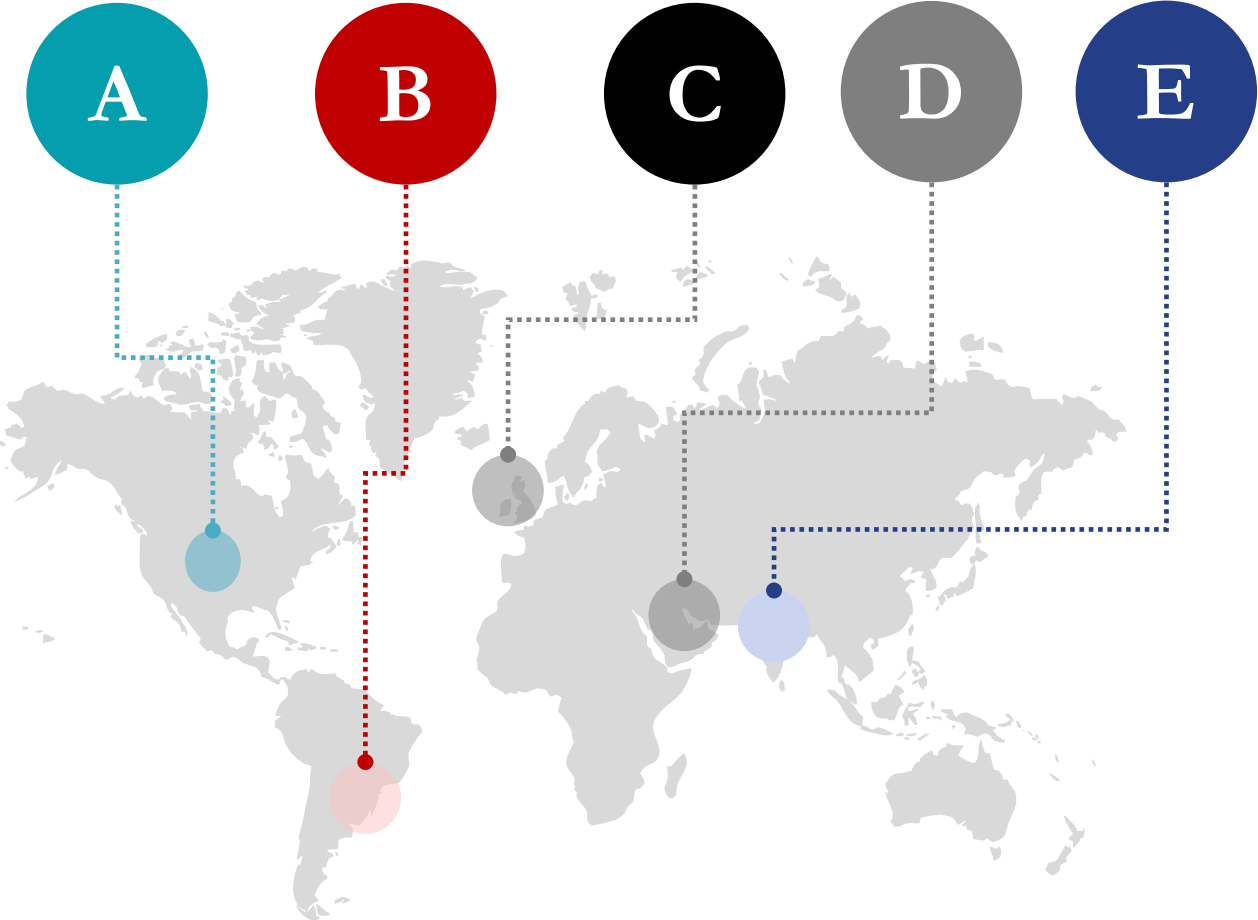
Text Generator

Solytics Value Proposition



© 2023 Solytics Partners. All Rights Reserved

Contact Us



A	USA
B	Argentina
C	UK
D	UAE
E	India

engagements@solytics-partners.com

About Solytics Partners

Solytics Partners is a global services and solutions provider in the area of Risk, Compliance, Analytics and Technology. We bring unique ecosystem of deep domain expertise, along with advanced analytics and new age technology to accelerate value creation for our clients. Our regulatory and industry best practices compliant services and technology solutions enable leading corporations and institutions worldwide to create and sustain competitive advantage.

Solytics Partners Privacy Notice

Solytics Partners is committed to respect your privacy and choices. We may collect, store and use your contact information, such as your name, email id and address to fulfil your request or to provide you additional information.

Disclaimer

This document is the proprietary property of Solytics Partners, all its legal entities and affiliates (the “Company”) and is strictly confidential. It contains information intended only for the person to whom it is transmitted. With receipt of this information, recipient acknowledges and agrees that: (i) this document is not intended to be distributed, and if distributed inadvertently, will be returned to the Company as soon as possible; (ii) the recipient will not copy, fax, reproduce, divulge, or distribute this confidential information, in whole or in part, without the express written consent of the Company; (iii) all of the information herein will be treated as confidential material with no less care than that afforded to its own confidential material.

The information provided in this document is for informational purpose only. It is not offered as advise on a particular matter and should not be relied upon as such and Solytics Partners disclaims any liability arising out of the use of the information for any purpose whatsoever. Solytics Partners makes every reasonable effort to present current and accurate information. However, Solytics Partners makes no guarantee of any kind with respect to the accuracy or otherwise. Solytics Partners reserves the right to modify the content of this document at any time without prior notice.

The details given in the document including the employee’s profiles and pricing information are only indicative. The actual profiles and pricing (if any) may vary depending on the scope of work and other applicable factors. Exchange of information through this document does not constitute a legal contract or consulting relationship with any person or entity.