



MAXIMIZING COMPLIANCE, MINIMIZING BURDEN: BIG DATA STRATEGIES FOR EFFICIENT REGULATORY REPORTING IN SMALL AND MID-SIZE BANKS

Abstract

As financial institutions navigate a competitive and dynamic landscape, there is a growing need for innovative strategies to optimize front to back regulatory ecosystem. The paper explores the practical application of Big Data for regulatory reporting in the context of the specific needs and challenges faced by small and mid-sized banks (SMBs). The paper also highlights key business and technology considerations for Big Data adoption by SMBs

Executive Summary

The regulatory landscape for small and mid-sized banks (SMBs) is constantly evolving, with new requirements and increased scrutiny placing a significant burden on compliance teams. Traditional reporting methods, often manual and siloed, struggle to keep pace with this growing complexity, leading to errors, inefficiencies, and potential penalties. Big data offers a powerful solution to these challenges. By harnessing its ability to capture, store, and analyze vast amounts of data, SMBs can streamline regulatory reporting, improve accuracy, and gain valuable insights.

This white paper explores the practical application of Big Data for regulatory reporting in the context of the specific needs and challenges faced by SMBs. We'll delve into:

- The evolving regulatory landscape and its impact on SMBs.
- The limitations of traditional reporting methods.
- How Big Data can transform your approach to regulatory reporting.

We will also provide insights and strategies to help you navigate the path towards a more efficient, accurate, and compliant future.

Introduction

While large institutions have often led the way in adopting big data ecosystem for regulatory compliance, SMBs have historically been hesitant due to perceived cost barriers and uncertain ROI. This hesitation is understandable, as building and maintaining the infrastructure required for traditional big data initiatives could be prohibitive.

This landscape, however, is undergoing a dramatic transformation. Early adopters of big data, particularly large institutions, are already reaping the benefits of this foundation through AI and generative AI, rapidly deploying use cases and gaining a competitive edge. Those who hesitated are now scrambling to catch up, facing the consequences of delayed adoption. This presents a unique opportunity for SMBs.

Big data is now becoming more accessible, and cloud-based

platforms have significantly lowered the entry barriers, making sophisticated data analytics more affordable than ever before for banks¹. Moreover, SMBs, known for their agility, can leverage this advantage to accelerate their transformation timelines and start reaping the benefits of AI and GenAI

at a faster pace than their larger counterparts. For SMBs, this shift signifies that leveraging big data is no longer just an option, but a necessity to remain competitive and compliant.

This is particularly critical as traditional regulatory reporting methods, often reliant on manual data collection, siloed systems, and static reporting formats, struggle to keep pace with the evolving regulatory landscape and the increasing volume and complexity of regulatory data. SMBs need to embrace these new technologies to streamline processes, improve accuracy, and gain valuable insights from their data.

“The successful integration of financial technology into the community bank business model is proving to be enormously valuable to enable community banks to enhance the services they've already proven they can deliver effectively. Access to technology and services to meet customer needs is critical to ensuring community banks remain vibrant.”


.....

Federal Reserve Board member Michelle W. Bowman in a 2020 speech

¹<https://www.linkedin.com/pulse/5-banking-practices-operationalize-low-cost-big-data-adoption-kelkar>




Here's why these traditional methods are falling short for SMBs:




a) Errors and Inaccuracy:

Manual data entry is prone to mistakes, potentially leading to inaccurate and inconsistent reports, which can raise red flags with regulators.




b) Time-Consuming Processes

Gathering, compiling, & analyzing data manually is a tedious & inefficient process, taking valuable time away from core banking activities.



c) Lack of Insights and Transparency:

Static reports lack the depth and detail needed by regulators to fully understand an SMB's operations and assess potential compliance risks.



d) Difficulty Adapting to Change:

Rigid reporting structures struggle to adapt to new or changing regulations, increasing the risk of non-compliance and potential penalties.

This is where Big Data steps in as a game-changer for SMBs. With its ability to capture, store, and analyze large amounts of data from various sources, Big Data provides a powerful solution to overcome these traditional reporting challenges. Banks, large and small, are starting to fully recognize the advantages and capabilities of effectively capturing, managing, and using data. In fact, of 300 senior executive bankers surveyed in 2021 and 2022, many indicated that data analysis and business intelligence rank as increasingly top priorities in new or replacement system application capabilities².

The regulatory landscape is no longer a static playing field. For SMBs, navigating this complex environment can be especially challenging, Big Data offers a lifeline by:



a. Cost Efficiency:

Implementing big data analytics can significantly reduce the costs associated with regulatory reporting. By automating data collection and processing, SMBs can minimize manual labor and reduce errors, leading to lower compliance costs.



b. Enhanced Accuracy and Timeliness:

Big data tools enable SMBs to process large volumes of data quickly and accurately. This ensures that regulatory reports are both comprehensive and precise, reducing the risk of non-compliance.



c. Improved Risk Management:

Big data analytics allows SMBs to monitor transactions and activities in real-time, enabling the quick detection of suspicious actions or deviations from regulatory norms. This proactive approach helps in mitigating risks and ensuring compliance with regulatory requirements.

78%

small financial institutions witnessed higher increases in compliance costs related to labor compared to their mid and large-sized counterparts (63%)

Source: [Corporate Compliance Insights](#)

~25%

improvement in the accuracy of regulatory reports, experienced by companies using big data analytics

Source: [Big Data analytics and financial reporting quality: qualitative evidence from Canada | Emerald Insight](#)

~20%

Cost reductions in various banking operations through Big Data adoption

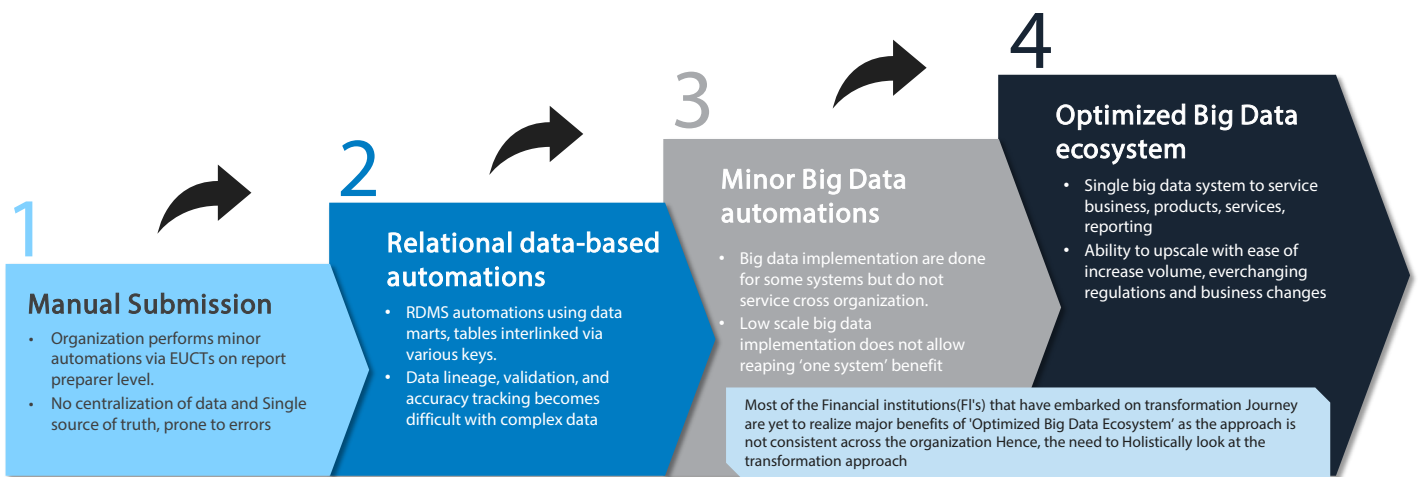
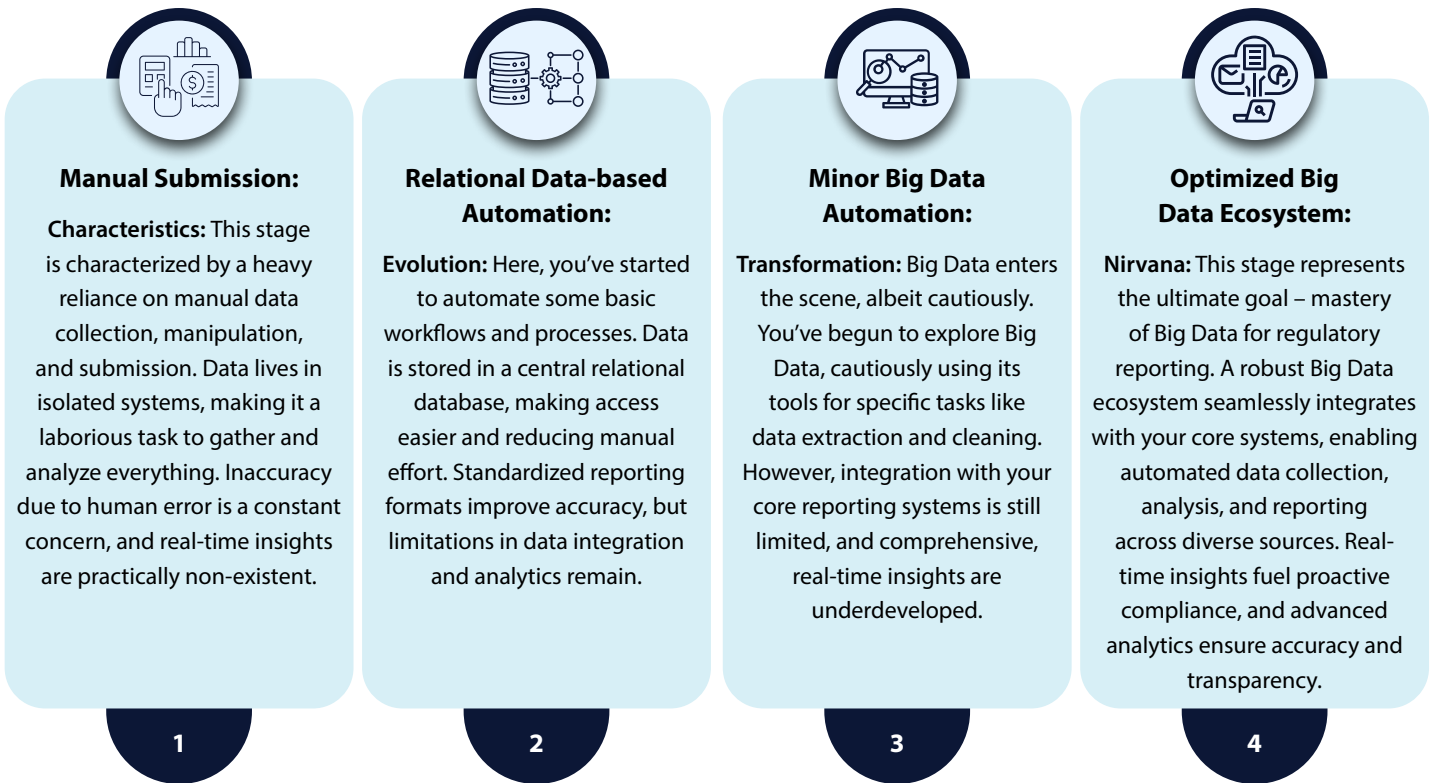
Source: [Digital & Analytics | Financial Services | McKinsey & Company](#)

² Cornerstone Advisors, *What's Going on in Banking 2023: Fighting the Headwinds, Riding the Tailwinds*, available at www.cornerstone.com/whats-going-on-in-banking-2023.

Various Maturity Models³: Assessing Your Journey toward Optimized Regulatory Reporting with Big Data

Regulatory reporting can feel like a complex maze for small and mid-sized banks (SMBs). It's not just about the tools; you need a clear roadmap to navigate the ever-changing requirements. That's where maturity models come in. These frameworks help assess your current capabilities and chart a course towards streamlined, accurate, and transparent reporting using Big Data.

Here, we'll explore a simplified four-stage maturity model designed specifically for SMB banks. This model will help you pinpoint where you stand today and identify the key steps to take for a smoother and more efficient regulatory reporting future.



³ This maturity model is a tool for self-assessment, not a rigid prescription. The specific steps and timelines will vary depending on your bank's size, resources, and existing infrastructure. However, by understanding these stages, you can identify your starting point and chart a course towards a more efficient and future-proof regulatory reporting approach with Big Data.



To better understand the above maturity models, let us take a few examples of the components of the regulatory reporting processes and differentiate how each level differs from others.

Component ⁴	Brief Description	Maturity Level: (1) Initial/ Manual	Maturity Level: (2) Emerging/ Relational DB and Automation	Maturity Level: (3) Structured/ Minor "Big Data" Automations	Maturity Level: (4) Optimized "Big Data" Ecosystem
Data Normalization	It is assumed to be normalization concept referred in relational databases	No concept of normalization and data is stored on ad-hoc basis/ as required	Traditional/ relational DB structure followed with primary and secondary keys with normalized data	Data normalization only in silos and for a few applications/ LoB's / processes that follow relational DB	As complete ecosystem moved over "Big Data", multiple data systems replaced by single repository and hence data normalization not required
Data Normalization	It is assumed to adjustments on the generated reports. Though we can also have intermediate adjustments (say within data mart) but this is with respect to reports adjustments.	Manual adjustments done over generated reports, but challenge is that underlying data does not reflect changes on the reports	Changes in the reports can be manually applied to underlying data (but need analysis on how data is utilized to prepare specific line items in reports)	Differences in reports and underlying data can be found using automation but corrections are still manual	Data adjustments can be done in underlying data in data repository or staging/ managed data layer and that is reflected in reports. So, front to back (FTB) data flow in sync with reports.
Data Snapshot Locking	It is more of technical concept where we are locking tables to ensure consistency across reporting.	No concepts of locking tables as data is stored on ad-hoc basis	Allows for locking of tables to ensure consistent reporting but is not a viable solution when considering regular updates as well as terra bytes of reporting data	Specific tables and those following RDBMS concept allows for data locking but possibility of data inconsistencies as not all LoB's/ processes have same underlying data for reporting	No need for data locking as processing is done on flattened data which is product or LoB agnostic and present in managed data layer.
DQ Checks	DQ checks that can be placed across FTB data flows	No option of applying any tool for DQ checks and need to be done manually.	Option of applying DQ checks as part of data processing or data loading (for e.g., using ETL)	Depending on the ecosystem, tools can be utilized for DQ checks (like Collibra, Informatica, etc.) but it entails multiple tools across FTB ecosystem	DQ checks can be applied using any of the market standard tool. It simplifies the checks as only single metadata definition of DQ check across FTB data flow
Report Lineage	It refers to tracking of data points referred in the regulatory reports	No option of report lineage as reports are generated manually	Supports lineage but only in limited way as data lineage is lost while traversing through multiple DataMart's.	Better lineage than relational database ecosystem but any tool implementation for lineage is challenging given multiple data structures	Allows for lineage through market standard tool. Also, consistent taxonomy ensures same understanding of data points across FTB data flow and making tool implementation simpler
Calculation Engine	It is referring to calculation engine for capital risk calculations, IFRS, etc.	Calculations done manually and hence no requirement of calculation engine	Each DataMart typically has its own calculation engine. Also, same calculation done by multiple engines across regions or LoB's.	Possibility of combining multiple calculation engines based on LoB's, regions or type of calculation but still there are a few calculations engine.	Only one calculation engine taking input from staging layer and giving output to managed data layer can be used across regions or LoB's or type of calculation.

⁴ Point to note is that we have picked only a few regulatory reporting components to differentiate and there are other components across regulatory front to back data flow (and across sourcing, enrichment, calculation and reporting).

Embracing Big Data for Regulatory Reporting: Key Considerations for SMBs

For small and mid-sized banks (SMBs), embracing Big Data for regulatory reporting represents a strategic investment. To ensure a successful implementation and unlock the true value of Big Data, collaboration across all levels of your organization is key – from senior management to frontline teams. Here, we explore some key considerations in both the business and technical domains that will contribute to success:

Business Considerations



Data Reconciliation: Regulatory reporting hinges on data accuracy. A robust data reconciliation process is crucial. This process identifies and resolves discrepancies between your existing systems and your new Big Data repositories. This ensures the integrity of your reported data and minimizes the risk of errors or penalties.



Data Governance: Big Data introduces vast amounts of information. To manage this effectively, you'll need strong data governance practices. This means establishing clear policies for who can access data, who owns it, and how long it's retained. This helps mitigate compliance risks and safeguards sensitive information.



Business-Friendly Interface: Develop a dedicated business layer on top of your Big Data architecture. Think of this as a user-friendly translation layer. It simplifies complex technical concepts into easy-to-use interfaces and reporting tools. This empowers your business users to leverage Big Data insights for better decision-making related to regulatory compliance.



Sandbox Environment: Encourage experimentation and innovation by creating a dedicated sandbox environment. This is a safe space for your data analysts and business users to test Big Data analytics tools and methodologies. It allows them to learn and refine their approach without impacting your core reporting systems.

Technology Considerations



Choosing the Right Framework: Don't reinvent the wheel! Leverage established Big Data frameworks like Hadoop or Spark. These frameworks provide a standardized set of tools and technologies, simplifying the integration and deployment of your Big Data architecture. This also helps you avoid vendor lock-in, giving you more flexibility in the long run.



Performance and Scalability Matter: Big Data is all about handling massive volumes of information. Therefore, choose technologies and infrastructure that can scale to meet your ever-growing data demands. This ensures smooth processing and responsiveness without compromising on performance.



Selecting the Right Data Storage: Data storage is a critical piece of the puzzle. Consider your needs and select a solution that balances cost, accessibility, and security. Distributed file systems like HDFS are a good option for storing raw data efficiently. For structured data that needs to be queried and analyzed quickly, data warehouses are a valuable tool.



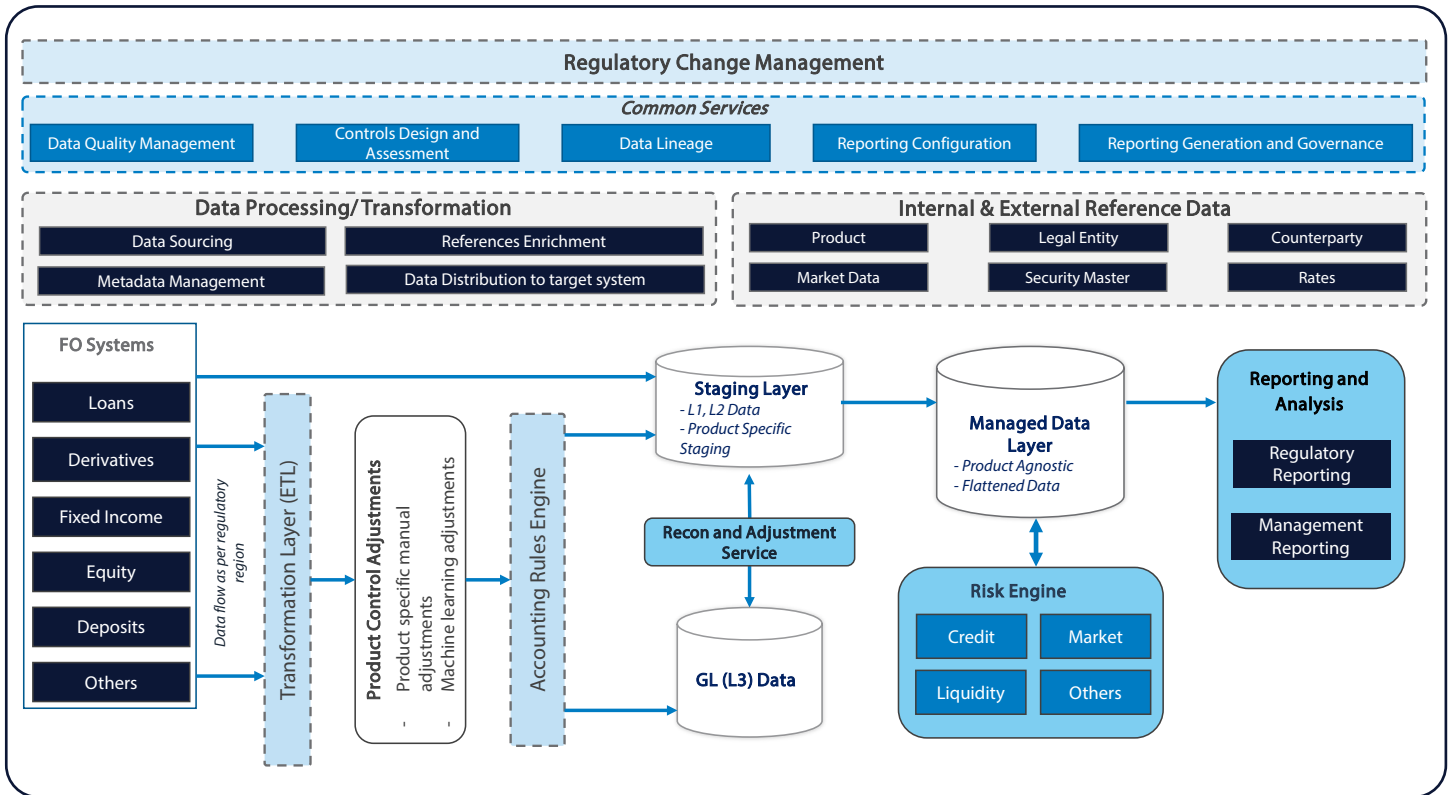
Prioritizing Data Security: Regulatory reporting data is often highly sensitive. Implement robust security measures to protect your data from unauthorized access and potential breaches. This includes encryption, access controls that restrict who can view or modify data, and intrusion detection systems to identify and address any security threats.

By taking these key considerations into account, financial institutions can embark on a successful Big Data journey for regulatory reporting. Remember, successful implementation requires ongoing attention to both business and technical factors, ensuring that your Big Data architecture delivers sustainable value for efficient and accurate regulatory compliance.



Simplified view of regulatory reporting ecosystem (and utilizing Big Data architecture)

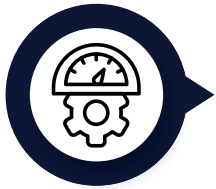
After deep diving into specific components, this section visually illustrates functional flow. For sake of simplification as well as to have strategic view, we have captured only the major components of the regulatory reporting ecosystem.



Unlocking Value: Unleashing the Benefits of Big Data for Regulatory Reporting

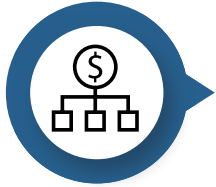
Successfully implementing Big Data architecture for regulatory reporting isn't just about ticking boxes – it's about unlocking a world of transformative benefits that elevate your compliance practices to a whole new level.

Let's explore some of the tangible advantages you can expect:



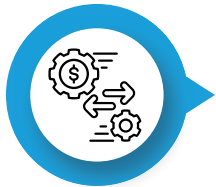
1. Streamlined Reporting – Faster, Effortless Compliance:

Say goodbye to manual, time-consuming processes and siloed data systems. Big Data automates workflows and integrates data seamlessly, making regulatory and internal reporting a breeze. Think faster turnaround times, less effort, and more time to focus on your core business.



2. Single Source of Truth – One Version, No Confusion:

Eliminate disparate data sources and fragmented records. Big Data establishes a single, authoritative source of truth, reducing reconciliation efforts and ensuring every report tells the same accurate story. This translates to a much stronger control model and enhanced trust with regulators.



3. Reconciliation Revolution – Effortless Harmony:

Forget about error-prone, manual reconciliation processes. Big Data brings standardized adjustments and automated workflows, paving the way for effortless data cleansing and alignment. Recon costs plummet, freeing up resources for strategic pursuits.



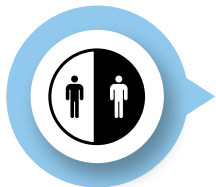
4. Reporting Layer Reimagined – All Roads Lead to Clarity:

Imagine a centralized reporting layer that caters to all your needs. With Big Data, generating regulatory submissions and internal analyses becomes effortless. Access the information you need, when you need it, with ease.



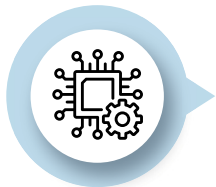
5. Risk Engine Evolution – Standardized and Agile:

Standardize your risk engine, making it a breeze to maintain and update in the face of changing regulations. Big Data empowers agile adaptation, ensuring your compliance posture remains robust and relevant.



6. Seamless Regulatory Reporting – Change is Good:

Embrace regulatory changes without the headache of frontend and submission mechanism overhaul. Big Data's flexibility allows you to adapt reporting seamlessly, keeping you ahead of the curve.



7. Predictive Power – Machine Learning to the Rescue:

Leverage the power of machine learning to anticipate potential issues. Define ML rules to predict GLI adjustments and identify data gaps before they become obstacles, proactively addressing compliance challenges.

By embracing Big Data for regulatory reporting, SMB banks can transform their entire approach to compliance. Imagine a future where reporting is effortless, accurate, and insightful. A future where agility reigns supreme and compliance becomes a source of competitive advantage. This is the power that Big Data unlocks for your bank.

How Infosys Consulting Can Help...

At Infosys Consulting, we partner with ambitious organizations to translate the Big Data opportunity into tangible results. We guide you through every step of the journey, from crafting a strategic roadmap to navigating technical complexities and fostering organizational change.

Based on your current stage...	We will help you to...	Our focus area will be...
<p>Have you just started to realize the scale of Big Data in business and regulatory filing rationalization?</p>	<ul style="list-style-type: none"> • Define the scope and size of the implementation • Establish Program Strategy and Vision • Craft implementation Strategy 	<ul style="list-style-type: none"> • Centralized taxonomy • Controls and Governance Framework to check usage • Program vision, success criteria and disposition framework
<p>You have already established firm level Big Data and AI/ ML program vision and mission and now need to:</p>	<ul style="list-style-type: none"> • Craft implementation Strategy • Choose technology platform and implementation partners • Execute "POC" use cases for identified functions 	<ul style="list-style-type: none"> • Implementation Framework • Platform Evaluation and Selection • Onboarding Prioritization • Implementation Program Set Up
<p>You already have a defined vision and strategy and are in midst of execution and now need to:</p>	<ul style="list-style-type: none"> • Scale and industrialize RegTech for priority areas • Achieve end to end integration with business • Enhance capabilities for complex use cases 	<ul style="list-style-type: none"> • POD based multiple delivery teams • Continuous Platform feature upgrade to allow full business integration • Integration Architecture and roadmap
<p>You have already realized significant value from holistic Big Data and AI/ ML program and now need to:</p>	<ul style="list-style-type: none"> • Identify opportunities for accelerated benefits realization • Evangelize and implement the vision at group level • Transition from RTB to BAU 	<ul style="list-style-type: none"> • Big data and AI ML as a service • Group level implementation of Big Data / AI ML systems • BAU Roles and Responsibilities, Governance and Controls

By partnering with us, you gain access to:



Proven frameworks and methodologies:

We draw on our deep experience to develop a customized roadmap for your unique regulatory environment and organizational needs.



Technical expertise:

Our team of Big Data specialists can help you select the right tools, architecture, and solutions to ensure seamless integration and scalability.



Change management guidance:

We understand the critical role of people in successful transformations. We help you cultivate a data-driven culture and equip your teams with the skills and knowledge to thrive in the Big Data era.

The choice is clear – embrace Big Data and unlock the unprecedented value it holds for optimized regulatory reporting. Partner with Infosys Consulting and embark on this transformative journey with confidence. Together, let's redefine compliance and propel your organization towards a future of efficiency, accuracy, and competitive advantage.



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Abhinav has over two decades of experience in the financial services industry, with a focus on Risk and Compliance. He has led the modernization engagements of many large global banks in their financial risk initiatives and helped them in multiple areas of regulatory compliance (ranging from setting up data warehouses, regulatory reporting to responding to MRAs).



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Gaurav is passionate about risk and regulatory reporting. He has successfully led programs for marquee financial services clients across regulatory change management, capital risk calculations, balance sheet modeling and taxonomy implementation. He also has a keen interest in emerging technological trends.



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Bharat is an experienced professional and has worked with international clients across multiple industries. Passionate about harnessing emerging technologies' potential in regulatory landscapes, he specializes in optimizing business processes and crafting targeted operating models for efficient Regulatory Change Management and Reporting.

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