The REGTECH Book

THE FINANCIAL TECHNOLOGY HANDBOOK FOR INVESTORS, ENTREPRENEURS AND VISIONARIES IN REGULATION

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The RegTech Book

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The RegTech Book

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Edited by
Janos Barberis
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A FinTech and RegTech Overview:

Where We Have Come From and Where We Are Going

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Introduction

In this overview, we seek to set the scene for all that is to come by providing a brief history of FinTech and RegTech, and by giving our particular view on the truly transformative potential of RegTech. In doing so, we draw upon some of our major works in the field.[1]

Regulatory and technological developments are changing the nature of financial markets, services and institutions. Financial technology, or FinTech, refers to the use of technology to deliver financial solutions, and regulatory technology, or RegTech, describes the use of technology in the context of regulatory monitoring, reporting and compliance. We argue that the true potential of RegTech lies in its ability to effect a profound transition from a Know Your Customer (KYC) to a Know Your Data (KYD) approach – one underpinned by efficient processes for the collection, formatting and analysis of reported data.

FinTech

The Evolution of FinTech

FinTech is not a new concept. The term 'FinTech' can be traced to the early 1990s,[2] and now refers to a rapidly developing evolutionary process across financial services.[3] The evolution of FinTech has unfolded in three stages, which we characterize as FinTech 1.0, 2.0 and 3.0.[4]

FinTech 1.0 (1866–1967)

Finance and technology have had a long history of mutual reinforcement, from early calculation technologies like the abacus, to the emergence of double entry accounting in the late Middle Ages and Renaissance. The late 1600s saw a European financial revolution featuring the rise of joint stock companies, insurance,

[1] D.W. Arner, J. Barberis and R.P. Buckley, 'FinTech, RegTech and the Reconceptualization of Financial Regulation', *Northwestern Journal of International Law and Business*, 37, no. 3 (2017): 371; and D.W. Arner, J. Barberis and R.P. Buckley, 'The Evolution of FinTech: A New Post-Crisis Paradigm?', *Georgetown Journal of International Law* 47, no. 4 (2016): 1271.

[2] Marc Hochstein, 'Fintech (the word, that is) evolves', *American Banker*, (2015), https://www.americanbanker.com/opinion/fintech-the-word-that-is-evolves

[3] Chloe Wang, 'Financial technology booms as digital wave hits banks, insurance firms', *Channel News Asia*, (2015), http://www.channelnewsasia.com/news/business/singapore/financial-technology/1875644.html

[4] D.W. Arner, J. Barberis and R.P. Buckley, 'The Evolution of FinTech: A New Post-Crisis Paradigm?', *Georgetown Journal of International Law* 47, no. 4 (2016): 1271.

and banking – all based on double entry accounting – which was essential to the Industrial Revolution.[5]

In the late 19th century, technologies such as the telegraph helped to forge cross-border financial connections.[6] This was followed by rapid post-World War II technological developments. By the end of this period, a global telex network had been implemented.[7]

FinTech 2.0 (1967–2008)

The late 1960s and 1970s saw rapid advances in electronic payment systems, including the establishment of the Inter-Bank Computer Bureau in the UK in 1968 and the US Clearing House Interbank Payments System in 1970. Reflecting the need to link domestic payments systems, the Society of Worldwide Interbank Financial Telecommunications (SWIFT) was established in 1973, followed shortly after by the 1974 collapse of Herstatt Bank – a crisis which served as the catalyst for the first major regulatory initiative, the establishment of the Basel Committee on Banking Supervision of the Bank for International Settlements in 1975.[8]

1987's 'Black Monday' saw stock markets crash globally; another reminder that global markets were technologically interlinked.[9] Advances in the mid-1990s underscored the initial risks with complex computerized risk management systems, with the collapse of Long-term Capital Management after the Asian and Russian financial crises of 1997-98.[10] However, the emergence of the internet in the 1990s provided the foundational change that made FinTech 3.0 possible.

FinTech 3.0 (2008 – present)

A confluence of factors emerged between 2007 to 2008, which provided the impetus for FinTech 3.0 in developed countries. The brand image of banks was severely shaken. A 2015 survey reported that Americans trusted technology firms far more than banks.[11]

The GFC damaged bank profitability and the regulation that ensued drove compliance costs to record highs. The timing of the GFC also played a critical role in FinTech's development. This phase has required high levels of smartphone penetration and sophisticated application programming interfaces (APIs), which would not have existed had the GFC occurred five years earlier.[12]

The key differentiating factors of FinTech 3.0 have been the rapid rate of development and the changing identity of those who are providing financial services. Start-ups and technology firms have challenged established financial institutions by offering specific, niche services to consumers, businesses and incumbent financial institutions.

FinTech 3.0 has also been characterized by the rapid growth of companies from 'too-small-to-care' to 'too-large-to-ignore'

[5] Charles More, *Understanding the Industrial Revolution*, (Psychology Press, 2000): 36.

[6] Tom Standage, *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's On-line Pioneers* (Bloombury, 1998).

[7] 'The history of fax: from 1843 to present day, Fax Authority, http://faxauthority.com/fax-history/

[8] History of the Basel Committee and its Membership, Bank for International Settlements, 2016, http://www.bis.org/bcbs/history.pdf

[9] Richard Bookstaber, *A Demon of Our Own Design* (John Wiley & Sons, 2007): 7–32.

[10] Philippe Jorion, 'Risk Management Lessons from Long-Term Capital Management', European Financial Management, (2000), http://merage.uci.edu/~jorion/papers%5Cltcm.pdf

[11] 'Survey shows Americans trust technology firms more than banks and retailers', *Let's Talk Payments*, (2015), http://letstalkpayments.com/survey-shows-americans-trust-technology-firms-more-than-banks-and-retailers/

[12] We thank David Link for making the point that sophisticated APIs were necessary to underpin much FinTech 3.0 activity, at the Melbourne Money & Finance Conference, 18 July 2016.

and finally 'too-big-to-fail'. This landscape raises the important question for regulators of precisely *when* they should begin to focus on certain industry participants. This highlights why the evolution of FinTech requires similar developments in RegTech. A flexible, multi-level approach is necessary to impose regulatory requirements with differing intensity based on the size and risk of firms.

FinTech in developed and developing economies

Today, FinTech impacts every area of the financial system globally, with the most dramatic impact perhaps in China, where technology firms such as Alibaba have transformed finance. China's inefficient banking infrastructure and high technology penetration make it a fertile ground for FinTech. Emerging markets, particularly in Asia and Africa, have begun to experience what we characterize as Fintech 3.5 – an era of strong FinTech development supported by deliberate government policy choices in pursuit of economic development.

FinTech development in Africa has been led by telecommunications companies on the back of the rapid uptake of mobile telephones and the underdeveloped nature of banking services. Mobile money – the provision of basic transaction and savings services through e-money recorded on a mobile phone – has been particularly successful in Kenya and Tanzania.[13] Mobile money has significantly spurred economic development by enabling customers to securely save and transfer funds, pay bills and receive government payments. M-Pesa remains Africa's best-known success story.[14]

[13] CGAP, *Infographic: Tanzania's Mobile Money Revolution*, CGAP (2014), http://www.cgap.org/data/infographic-tanzanias-mobile-money-revolution

[14] Safaricom, *M-Pesa Timeline,* (2016) http://www.safaricom.co.ke/mpesa_timeline/timeline.html

RegTech

RegTech refers to technological solutions that streamline and improve regulatory processes. In contrast to FinTech's inherently financial focus, RegTech has the potential to be applied in many regulatory contexts, both financial and otherwise. Further, while FinTech growth has been fueled by start-ups, RegTech has emerged in response to top-down institutional demand arising from the exponential growth of compliance costs.[15]

The Evolution of RegTech

RegTech 1.0

In the 1990s and 2000s, institutions encountered increasing regulatory challenges as they became more global, catalyzing the development of large compliance and risk management departments. By the 1980s, financial technology was being employed to facilitate risk management as finance itself became increasingly reliant on IT systems. Financial engineering and Value at Risk (VaR) systems became embedded in major financial institutions,[16] and would ultimately prove to be among the major contributing factors to the GFC.[17]

By the beginning of the 21st century, the financial industry as well as regulators suffered from overconfidence in their ability to apply a quantitative IT framework to manage and control risks.[18]

[15] Institute of International Finance, *RegTech: Exploring Solutions for Regulatory Challenges 2*, no. 1 (2015).

[16] Joe Nocera, 'Risk Management – What Led to the Financial Meltdown', *New York Times*, (2009), http://www.nytimes.com/2009/01/04/magazine/04risk-t.html

[17] Andreas Krause, 'Exploring the Limitations of Value at Risk: How Good Is It in Practice?', *Journal of Risk Finance* 4, no. 2, (2003): 19.

[18] Felix Salmon, 'The Formula that Killed Wall Street', *Significance*, 9, no. 1, (2012): 16.

Regulator overconfidence manifested in the unduly heavy reliance of the Basel II Capital Accord on internal quantitative risk management systems of financial institutions.[19] This false sense of security was brutally exposed by the GFC, which ended the first iteration of RegTech, RegTech 1.0.

Another illustration of RegTech 1.0 is the monitoring of public securities markets. Regulators rely upon trade reporting systems maintained by securities exchanges to detect unusual behavior.[20] The GFC exposed the limitations of these systems – they cannot shed light on transactions that occur off the exchange.[21] Regulators around the world reacted by mandating the reporting of all transactions in listed securities, regardless of where they took place. Such reporting requirements will have to be met with enhanced regulator IT systems to analyse the reported information – an enhancement which is part of the next stage of RegTech's development.

Ultimately, RegTech 2.0 has emerged in response to post-GFC regulatory requirements. These waves of complex regulation have drastically increased compliance costs,[22] and regulatory fines and settlements have increased 45-fold.[23] Adding to rising costs is the increasing fragmentation of the regulatory landscape. Despite attempts to establish similar post-crisis reforms, regulatory overlaps and contradictions between markets are not uncommon and financial institutions have unsurprisingly looked to RegTech to optimize their compliance management.[24]

RegTech 2.0

RegTech provides the foundation for a shift towards a proportionate, risk-based approach – a RegTech 2.0 – underpinned by efficient data management and market supervision. AI and deep learning are just two examples of new technologies that demonstrate the potential for automating consumer protection, market supervision and prudential regulation.[25]

RegTech 2.0 primarily concerns the digitization and datafication of regulatory compliance and reporting processes. Not only does it represent the natural response to the digitalization of finance and the fragmentation of its participants,[26] but it also has the potential to minimize the risks of the regulatory capture which occurred prior to the GFC.[27] Regulators in the US, UK, Australia and Singapore have already begun attempts to develop

[19] Staffs of the International Monetary Fund and The World Bank, *Implementation of Basel II – Implications for the World Bank and the IMF*, (2005), http://www.imf.org/external/np/pp/eng/2005/072205.htm#s2

[20] The Board of the International Organization of Securities Commissions, *Technological Challenges to Effective Market Surveillance Issues and Regulatory Tools: Consultation Report 14-15* (August 2012).

[21] United States SEC Commissioner Luis A. Aguilar, *Shedding Light on Dark Pools (Public Statement),* (18 November 2015), http://www.sec.gov/news/statement/shedding-light-on-dark-pools.html#_edn5

[22] Jeff Cox, *Misbehaving banks have now paid $204B in fines*, CNBC, (2015), http://www.cnbc.com/2015/10/30/misbehaving-banks-have-now-paid-204b-in-fines.html

[23] Piotr Kaminski and Kate Robu, *A Best-Practice Model for Bank Compliance*, McKinsey, (2016), http://www.mckinsey.com/business-functions/risk/our-insights/a-best-practice-model-for-bank-compliance

[24] Eleanor Hill, *Is RegTech the Answer to the Rising Cost of Compliance?*, (2016), FX-MM, http://www.fx-mm.com/50368/fx-mm-magazine/past-issues/june-2016/regtech-rising-cost-compliance/

[25] Maryam Najafabadi, Flavio Villanustre, Taghi M. Khoshgoftaar, Naeem Seliya, Randall Wald and Edin Muharemagic, 'Deep Learning Applications and Challenges in Big Data Analytics', *Journal of Big Data* 2, no. 1 (2015).

[26] Global Partnership for Financial Inclusion, *G20 High-Level Principles for Digital Financial Inclusion* 12, (2016), http://www.gpfi.org/publications/g20-high-level-principles-digital-financial-inclusion

[27] Douglas Arner and Janos Barberis, 'FinTech in China: From The Shadow?', *Journal of Financial Perspectives* 3, no. 3, (2015): 23.

a fresh regulatory approach that caters to the dynamics of the FinTech market.[28]

Examples of fertile areas for RegTech development include: (i) application of big data approaches, (ii) strengthening of cybersecurity and (iii) facilitation of macroprudential policy. With respect to big data, regulators are starting to consider technological solutions for the management of AML/KYC information produced by industry participants, notably suspicious transactions reports. Strong IT capabilities to analyse the data provided are paramount if regulators are to achieve the underlying objectives of such requirements.

Cybersecurity represents one of the most pressing issues faced by the financial services industry and further underscores the necessity of continued regulatory development.[29] The shift towards a data-based industry is inevitably accompanied by a rising threat of theft and fraud.

Macroprudential policy offers yet another promising ground for RegTech. It ultimately seeks to soften the severity of the financial cycle by utilizing large volumes of reported data to identify patterns and changes over time.[30] Central banks are making progress in identifying leading indicators of financial instability[31] in the form of data 'heat maps', which alert regulators to potential problems identified through quantitative analysis and stress testing large volumes of data.[32]

These early efforts indicate the probable move of RegTech into macroprudential policy. This occurs against the backdrop of regulators continually identifying the need for ever more data.[33] The additional reporting requirements that this generates for institutions drives the need for refinement of RegTech processes and the establishment of centralized support services to manage not only the data, but the formats required. Risk data aggregation requirements have been established by the Basel Committee (in 'BCBS 239') which encourage institutions and regulators to focus on near real-time delivery and analysis.[34]

What's Next for RegTech: RegTech 3.0?

RegTech 3.0 is our term for the future of RegTech. The FinTech sector is shifting its focus from the digitization of money to the monetization of data, making it necessary for new frameworks to accommodate concepts such as data sovereignty and algorithm supervision.

The data-centricity underpinning the evolutions of both FinTech and RegTech represents the early stages of a profound paradigm shift from a KYC to a KYD approach. As this unfolds, regulators must invest heavily in the development of proportionate, data-driven regulation to deal effectively with innovation without compromising their mandate. One important aspect is the design

[28] ASIC, *Fintech: ASIC's Approach and Regulatory Issues* 10-12 (Paper submitted to the 21st Melbourne Money & Finance Conference, July 2016); ASIC, *Further Measures to Facilitate Innovation in Financial Services* (Consultation Paper No. 260, June 2016).

[29] Financial Stability Oversight Council, *FSOC 2016 Annual Report (2016).*

[30] International Monetary Fund, Financial Stability Board and Bank for International Settlements, *Elements of Effective Macroprudential Policy*, (2016).

[31] BIS Committee on the Global Financial System, *Experiences with the Ex Ante Appraisal of Macro-Prudential Instruments*, CGFS, Paper No. 56, July 2016.

[32] International Monetary Fund, Financial Stability Board and Bank for International Settlements, *Elements of Effective Macroprudential Policy*, (2016).

[33] Financial Stability Board and International Monetary Fund, *The Financial Crisis and Information Gaps: Second Phase of the G-20 Data Gaps Initiative (DGI-2) – First Progress Report* (September 2016).

[34] The Basel Committee, *Principles for Effective Risk Data Aggregation and Risk Reporting*, (2013).

of core elements of financial ecosystems in order to leverage technology to achieve major regulatory objectives of financial stability, financial integrity, financial inclusion and balanced development – a path an increasing number of countries are choosing to follow.[35]

Conclusion

The longstanding marriage of technology and finance has been continuously evolving. In the near future, regulators will come under increasing pressure to adapt to the newly fragmented market comprising major banks, established tech firms and lean start-ups. RegTech can be employed to not only assist authorities to monitor and regulate industry participants, but to identify *when* to do so. In the wake of increased compliance burdens, regulators will need to work with FinTech and RegTech players to understand how data are being collected and processed, harmonize compliance requirements across markets, and enhance not only data sharing among regulators but the ways in which such data are used.

RegTech presents benefits to both industry and regulators by empowering financial institutions to effectively control costs and risks,[36] presenting new opportunities for FinTech start-ups and tech firms,[37] and allowing the development of continuous monitoring tools.[38]

RegTech's truly transformative potential lies in its capacity to enable the real time monitoring of financial markets. Markets are evolving to rely more on data. The institution with the most data will be best placed to assess the borrower's credit risk, and those institutions are increasingly likely to be large tech companies or retail conglomerates operating customer loyalty schemes, rather than banks.[39] The evolution of this new form of financial service provider will demand further evolution of RegTech as the market moves from relying on a 'know-your-customer' to a 'know-your-data' paradigm.

[35] See Douglas Arner, Ross Buckley and Dirk Zetzsche, *FinTech for Financial Inclusion: A Framework for Digital Financial Transformation* (Alliance for Financial Inclusion, September 2018).

[36] Citigroup, *Comment Letter on Regulatory Capital Rules*, 3 (2013), https://www.federalreserve.gov/SECRS/2013/October/20131030/R-1460/R-1460_102113_111420_579523237031_1.pdf

[37] Adrian Shedden and Gareth Malna, *Supporting the Development and Adoption of RegTech: No Better Time for a Call for Input*, Burges Salmon 2, (2016), https://www.burges-salmon.com/-/media/files/publications/open-access/supporting_the_development_and_adoption_of_regtech_no_better_time_for_a_call_for_input.pdf

[38] Daniel Gutierrez, 'Big Data for Finance – Security and Regulatory Compliance Considerations', *Inside Big Data,* (2014), http://insidebigdata.com/2014/10/20/big-data-finance-security-regulatory-compliance-considerations/

[39] D.A. Zetzsche, R.P. Buckley, D.W. Arner and J.N. Barberis, 'From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance', *New York University Journal of Law & Business* 14, no. 2, (2018): 393.

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He has written five books, edited a further five, and written over 140 book chapters and articles in leading journals in all major jurisdictions. His joint research on FinTech and RegTech has been downloaded from the Social Science Research Network more often than that of any other author.

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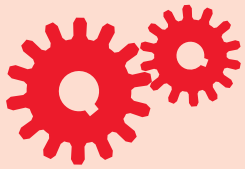
Introduction

1

RegTech

- Compliance difficulty because of regulatory changes, jurisdiction coverage, cost not revenue center
- Commoditization of tech opens opportunity for billion $ market
- Machine readable regulation facilitates compliance automation



- Post-crisis change marked by increase in corporate fines, personal liability and regulatory changes
- RegTech to be embedded in product to break compliance/business silo
- Alignment of start-up, banks and regulators interest to develop markets

- RegTech opportunity is in the technology but also people improvement
- Increased pressure on compliance/legal departments to implement fast solutions as regulatory cycles shorten
- For financial institutions RegTech is a cost saver, for society it's about stability

- 20-30% of bank cost dedicated to GRC
- FinTech start-ups incentivized to use RegTech to have a scalable process as they build, while corporate want to decrease pre-existing costs
- AI has strong use case to identity false positives, but algorithm liability is key

- Customer identification process to go from analogue (kyc) to digital (e-kyc)
- Development of digital identity utilities will decrease cost spent by FI and time spent by consumers
- Bank need to shift business models and consider user data as an asset not a liability

This part sets out to provide an overview of the RegTech sector and its development.

By contextualizing the origin of the industry's growth generated by the post-financial crisis increase in fines and the acceleration of new regulation and personal liability, the following chapters highlight the opportunities RegTech offers. It is important to differentiate the RegTech opportunities as a market reform as opposed to a market reaction, to which FinTech is more akin. In addition, as will be elaborated upon in Part 9, RegTech applicability expands beyond the financial services industry. As a direct related matter, the US$20 billion in spending predicted to occur by 2020 is only for one industry.

The automation of regulatory obligations represents a transition from People, Process, Paper (3P) towards Automation, Real-Time, and Predictive (AIR). The obvious impact is in the decrease of compliance costs for financial institutions but also the improvement of the market supervision role for regulators and even customer experience for clients. A less immediate impact is that a well-implemented RegTech strategy can enable the multi-million-dollar digital transformation efforts being initiated by financial institutions globally.

As an industry in general, financial institutions perceive RegTech providers as cost-cutting options, with some systems benefiting from consortiums and network effects. As legal and compliance teams increase their understanding of the innovation potential of these start-ups and technologies, RegTech offers a competitive advantage in the market, from painless compliance procedures that enhance customer retention to the avoidance of large regulatory fines diverting capital away from new initiative.

Success will rely on corporates (see Part 6) and start-ups (see Part 5) addressing challenges such as how they can adapt solutions across jurisdictions, be future-proof against regulatory uncertainty, and convince clients of the opportunities despite a high risk of error.

What a RegTech Compliance Killer System Will Look Like

By Bernard Lunn
CEO, Daily FinTech

Compliance is a big, ugly problem, and it is getting worse, and nobody has nailed it yet. In short, compliance is a tremendous opportunity. Investors say: 'Show me compliance deals'. Bankers say: 'Show me a solution'. Financial technology (FinTech) companies say: 'We must spend our precious cash on lawyers and regulatory experts'.

Nobody loves compliance. Everybody hates compliance. That is why it is a massive opportunity. Like a cure for cancer or cheap and abundant renewable energy, the problem is easy to state, but the solution is far, far harder to build.

We have seen a lot of regulatory technology (RegTech) solutions, but we have yet to see the killer system. We see lots of lawyers and outsourcing firms willing to throw worker-hours at the problem. We also see lots of point solutions. These are, at best, putting bandages on the wound.

So far we haven't found a killer solution; however, we do know what a killer solution needs to look like. There are five attributes that we detail later, after presenting a requirements checklist.

Before detailing the checklist, here are the seven reasons why compliance is so hard.

1. *It is a moving target*. Since the financial crisis, we have had lots of new regulations and lots of new scandals (which trigger new regulation). At the same time, we have the emergence of bitcoin, which is entirely uncharted territory.
2. *It is a territorial hairball of complexity*. Finance is a global business, and 'bits do not stop at borders'. However, money does stop at borders, and each country has its own spin on regulation. There are even cross-border variants such as Islamic finance. Each is critical. Put them all together, and the result is seriously nasty and complex, and in a global economy, that is the reality we have to deal with.
3. *It is an easy lever for politicians to pull*. Beating up bankers is a natural vote catcher. The negatives from too much regulation are not so visible, and causation is unclear. So it will always be a moving target, and it will still get more complicated.
4. *It is a cross-cutting concern*. Like cyber security, compliance cuts across every system, including ones written before most of today's regulation was even a gleam in the eye.
5. *It does not have a revenue line attached*. Despite the massive risk posed by compliance failure, there is no revenue line from which a banker can grab budget.
6. *It is an existential threat*. Get it wrong, and you could be gone tomorrow. So, nobody loves spending money on compliance, but you have to spend money on it.
7. *It is functionally complex*. There are so many areas to understand, and each is complex on its own – money laundering (know your customer [KYC]), tax (Foreign Account Tax Compliance Act [FATCA]), consumer protection, data privacy, and systemic risk (Dodd-Frank Act). Add them all together, and it is a recipe for sleeping like a baby (waking every few hours screaming).

The following is the high-level five-point checklist for a great RegTech compliance solution:

1. *Real-time data in context*. Big data is just so-called digital landfill unless it is delivered just in time and in context. 'Just in time' means that the data is made available in real time even if it is not consumed in real time. It is not relevant until it is relevant in context (which is why it is not always consumed in real time). For example, consider a conflict of interest statement. The fact that a family member just moved into a conflict of interest position is

useful only if delivered within the context of a system where you need to declare any conflicts.

2. *Legacy integration*. Any solution that involves changing the legacy system is a showstopper. It is the weakest link issue. Just one legacy system that is not integrated could be your compliance nightmare. Combining 1 and 2 (real-time data in context plus legacy integration) is tough. Rewriting all apps to be compliant is expensive and takes too long. Doing integration according to the constraints of decades-old middleware and batch-based core systems is hard but essential.
3. *Understanding the risk/reward trade-off*. Perfect compliance is like perfect security. Designing an ideal compliance system is straightforward. Any bureaucrat can do that. The problem is that you will stop the business as all customer-facing processes grind to a halt, or you instead encourage people to ignore compliance rules and just pay the fines as a cost of doing business. In the real world, there is a trade-off between compliance and frictionless onboarding. When creating a compliance solution, you need marketing growth hackers on the team as well. You have to enable internal people, customers, and partners to all do their jobs without putting the business in great danger.
4. *Immutability*. A shared database where all parties can trust that nobody can change the data it contains is a big deal. This is where blockchain technology could be a breakthrough, although there is no need to use blockchain technology to get a distributed and immutable (append-only) database.
5. *Rules-based user interface for non-programmers*. Apart from death and taxes, we can be confident that compliance rules will change and grow in complexity. Unless a compliance person can 'code' these rules using legal language rather than programming code, any solution will quickly become obsolete.

There are two big reasons for optimism. The first is the perennial one that, with technology getting better, faster, and cheaper every day, some entrepreneur will create a compliance killer system that meets the aforementioned five attributes – the prize is certainly big enough. This is an article of faith, similar to saying that we will get a cure for cancer or cheap and abundant clean energy without knowing how we will get there.

The other reason for optimism is based more on the observable fact that the regulatory environment is getting easier.

Yes, you read that right. I wrote that the regulatory environment is getting easier.

The reason is that politicians, fearing citizen backlash, are starting to rein in the worst bureaucratic tendencies of regulators. For a long time, entrepreneurs faced competition, and regulators sent them the rule book. Regulators were government employees who thought about competition only in the abstract. Today, the environment is more fluid, as governments recognize the economic return on innovation regarding jobs and gross domestic product (GDP) growth. The regulators now face real competition because their political masters have to keep citizens happy, and citizens care about employment and GDP growth. With both FinTechs and global banks being increasingly mobile, jobs can disappear fast if regulators get it wrong. Plus, innovation is the primary driver of productivity, which drives GDP per capita.

Pity the poor regulator who must balance that with protecting citizens from fraud and abuse. This has led to two positive developments:

First, simpler and unbundled regulation in many countries. Unbundled regulation means you could get a payment license, or a deposit license, or a current account license.

Second, tech-smart regulation. Two examples are the second Payment Services Directive (PSD2) in Europe and payment bank licenses in India. This moves from 'throw the paper rule book at your compliance team of lawyers' to 'send standards docs and application programming interface (API) specs to your tech team'.

FinTechs and small and medium-size enterprises (SMEs) will drive change. Incumbents and corporate entities can throw lawyers and outsourcers at the problem. This is not an option for FinTechs and

SMEs. This is where tech-smart regulation is critical. Consider the eXtensible Business Reporting Language (XBRL).

Real-time Data Machine-readable Streams for Regulators

In the wake of the financial crisis in 2008, the US government mandated machine-readable financial reports via XBRL. That was a wonderfully progressive move that could dramatically change the efficiency and reliability of the capital markets by bringing financial reporting into the twenty-first century. Then came the backlash, with politicians claiming to save small businesses from the burden of regulatory compliance.

To understand why this is baloney, travel with a financial data item through the financial reporting process:

> *Step 1. Start as an electronic bit in an accounting/enterprise resource planning* (*ERP*) *system*. The data is now perfectly machine readable and gets aggregated and processed most efficiently.
>
> *Step 2. The data is converted into a human-readable form for the Securities and Exchange Commission (SEC)*. For many companies, the only time their numbers are on actual paper is when they send their reports to the SEC.
>
> *Step 3. Somebody extracts the data from a PDF or HTML file and turns it back into a machine-readable bit in XBRL format*. That 'somebody' is probably working for an outsourcing firm that is being paid by the company doing the reporting because it has to comply with the SEC mandate.

Step 3 looks more like a burden that should be eliminated. However, the solution is *not* to eliminate Step 3. *The solution is to eliminate Step 2*. Technically this is simple.

Imagine the poor overloaded folks at the SEC surrounded by piles of paper. They are dedicated, smart, and hardworking. They will therefore have evolved a system that sort of works – poring over individual company filings and marking something odd about a data item in a footnote with a yellow pen, and then digging through a pile of documents to look on page 256 of another report (having cleverly marked the page) to correlate something odd on that other company's filing …

Imagine if all the data was in XBRL electronic format and they could let an algorithm do the grunt work so that they could do the higher-level work needed to catch the bad guys and maybe avoid a repeat of the financial system's 'cardiac arrest moment' in September 2008.

The algorithms could process thousands of companies to look for that anomaly, that weird thing that says, 'something looks fishy'. The data surfaced by the algorithms still require the higher-level cognitive and pattern-matching skills of humans. This is about empowering the SEC staffers to be more efficient. I imagine that they would vote for this change.

The work done by SEC staffers is impossible without better systems. The devil is in the details, or to put that in financial reporting language, the devil is in the footnotes (where a company buries that embarrassing fact it wants investors and regulators to gloss over).

Forward-looking regulations will eventually leave behind the cute constructs of the analogue age – paper and batch cycles – and demand data streams that they can parse as needed in real time. In the meantime, compliance has to deal with both the new real-time world and the legacy batch world, and history teaches us that legacy sticks around a lot longer than anybody anticipated.

Sharing the KYC Burden for Small Business Through Digital ID

Compliance is a pain for BigCo, but it is a manageable pain. It is impossible for SMEs, which do not have significant compliance departments. That is why we see change being driven by SME needs. This is starting to happen through partnerships. A natural fit could be a large telecommunications company partnering directly with a challenger bank. Telcos are hungry to diversify into new revenue streams amidst an increasingly digital landscape, and they are the natural repositories of digital identification (ID) (which is the key to KYC). Once the digital ID problem has been solved, the rest of RegTech is a lot easier. Digital ID remains a thorny issue, with societal-level problems around privacy, but these can be resolved with technology, and it is likely that forward-looking telcos will drive that change because the mobile phone is the key to digital ID.

Technology-Enabled Collaborative Compliance

By Zeeshan Rashid
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The tsunami of regulations that started from the financial crisis does not seem to have ceased, and the cost of non-compliance has become prohibitive. The quantum of fines that banks have had to pay over the past three to five years suggests that setting aside provisions will not suffice: non-compliance hits the top line and the bottom line directly. No wonder up to 70% of management's time is spent on managing compliance, which in any realm of the imagination is unacceptable.

The key challenges faced by the industry in managing compliance are the following:

Ever-increasing volume. New regulations just keep on coming. The Trump administration has said that for every new regulation introduced two old regulations have to go away. With the increasing complexity of businesses and risks, it is easier said than done. With Brexit, hundreds of laws and regulations will have to be drafted by the United Kingdom once it officially leaves the European Union.

Rising personal liability. There seems to be a direct correlation between the rise in regulations and the personal liability of compliance officers.

Growing staffing challenges. An immediate reaction to the rise of regulations is to hire more people to deal with them. There are two problems with this. First, skilled compliance personnel are always in short supply; second, hiring in a large number can at best be a tactical fix; the costs and complexities associated with mass hiring will bite in the long term.

There has always been a disconnect between the compliance department and the business lines, including risk management. Traditionally compliance has been treated as the prime responsibility of the compliance department. Other departments handle it just as a tick in the box and focus only on their key performance indicators (KPIs). For example, for a trader, the key is to make money; for a salesperson, it is to increase turnover; and so on. In the process, compliance takes a backseat. If there is a compliance failure, the blame game starts, and in most cases the compliance department bears the brunt of it. There is a lack of collective or shared responsibility.

Technology-enabled collaborative compliance is the answer to the challenges faced by the stakeholders.

Collaboration in Compliance Is Key

Collaboration in any field or industry always has its positives. From a compliance perspective, partnerships can bring a lot of value to the organization and the industry.

Collaboration for compliance can be viewed on three fronts, as shown in Figure 1.

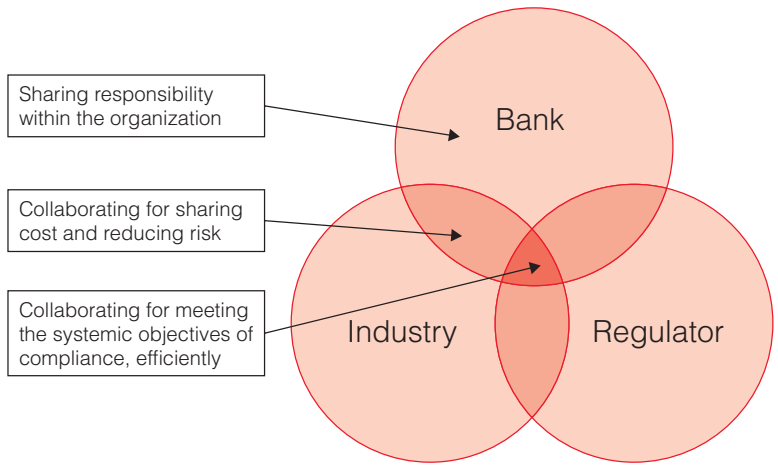

Figure 1: Areas for collaboration with FinTechs, customers and industry bodies

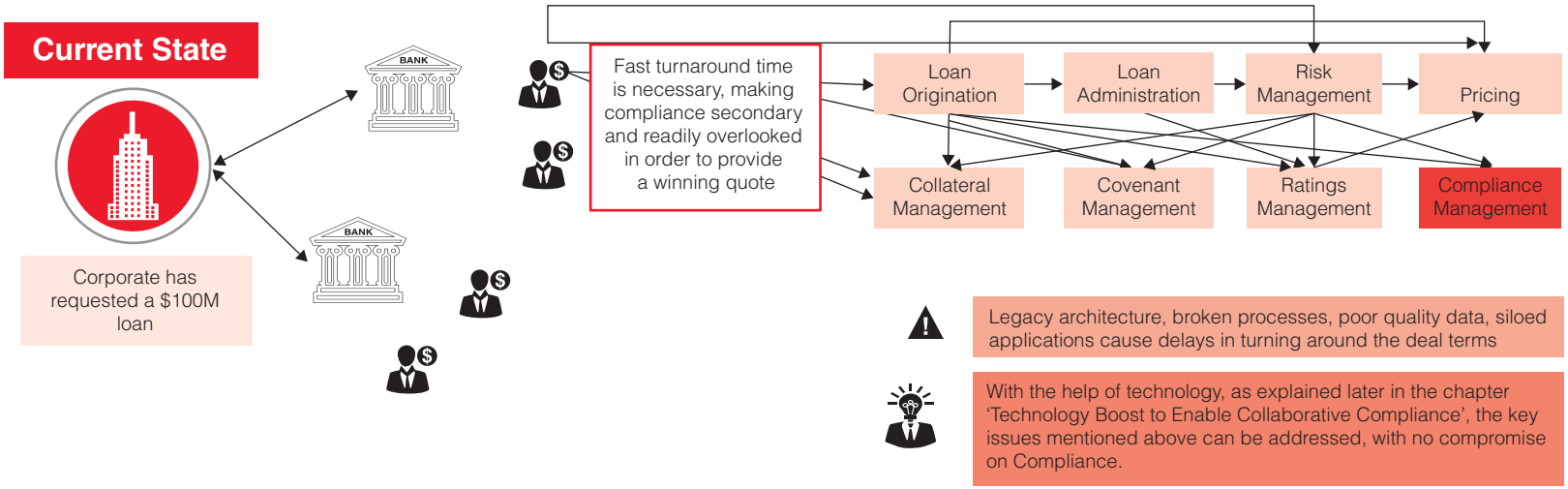

Figure 2: Examples of key challenges in the origination process

Let's consider each one of them in detail.

Sharing Responsibility Within the Organization

Compliance to a large extent is a centralized function within an organization. In this hypercompetitive world, all employees are driven by metrics they will be measured on, and compliance does not feature at the top of the list.

Figure 2 depicts the typical challenges in the case of a loan origination process.

Let's articulate a wish list for those personnel outside the compliance department. Compliance processes should not affect time to market, be an impediment to generating new business, or adversely impact the customer experience. Instead, compliance processes should have a high degree of automation, built-in circuit breakers, and early warning indicators, and should be demonstrable.

The key to collaboration, in this case, is to make compliance a part of the business processes with the help of technology. Key enablers (Figure 3) already exist within the organization. They just have to be channelled in the right direction.

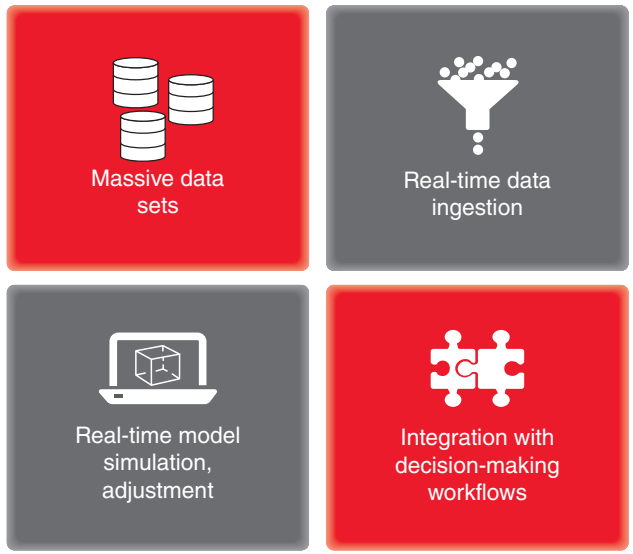

Figure 3: Key enablers for the wish list

Banks have massive data sets consisting of structured and unstructured data, which can be harnessed with the use of technology for multiple purposes, including compliance. Moving towards real-time data ingestion and real-time analytics models and simulation gives a shot in the arm to enable real-time compliance. There will be a need to scale up the infrastructure to manage the need for real-time data ingestion and analytics. Financial institutions understand the importance, and many are already running transformation programs to enable it. Last but not least is the integration of the real-time flows with decision-making work flows to complete the cycle and provide a well-rounded solution, helping everyone in the organization to feel responsible for compliance without feeling the burden of doing it.

In the case of the loan origination process as shown in Figure 2, a large multinational firm has invited banks to bid for a new $100 million multi-country credit line and needs to know the best deal in a very short turnaround time (TAT). Assuming our bank has a well-structured and real-time response for its sales needs and has baked in compliance as a part of the business processes, the sales staff will know that the numbers that will be given by the system would have ticked the boxes for all the compliance requirements. As a result, they can confidently give the numbers and other details to the customer. There is all-round collaboration within multiple divisions within the bank. If the competition tries to be aggressive without concern for compliance and churns out rates just to win the deal, our sales staff's tools will have circuit breakers that will not allow them to go beyond safe limits, in the process safeguarding the interests of the bank.

Collaborating Within the Industry

The basic reason for compliance is to 'provide protection to stakeholders and manage risks'. With this reasoning, compliance will not be considered a source of competitive advantage. Hence, there is a business case for collaboration within the industry to do the following:

- Bring down the cost of compliance.
- Reduce the risk of non-compliance.
- Enable real-time detection.
- Optimize usage of resources.

A collaboration would require agreement on a standardized information model, operational processes, data security and privacy, and the technology platform enabling the operations. Sharing services or utilities is an example of collaboration within an industry. The success of a utility depends on the critical mass (the number of organizations sharing the vision).

Know your customer (KYC) utilities have existed for some time now, providing the ability to assess the risk profiles of customers as part of onboarding as well as during the lifetime of engagement. Another example is in the area of operational risk.

Twelve member firms founded the Operational Riskdata eXchange Association (ORX);[1] membership has now grown to 93, with companies from 23 countries. ORX was set up as an organization that will help financial organizations collaborate to better manage operational risk by setting standards and sharing operational risk data, research, and tools to validate scenarios.

There is a buzz around creating utilities for transaction monitoring for anti–money laundering (AML) operations, large-scale reconciliation, regulatory reporting, and so on.

Blockchain is another exciting area for collaboration within the industry and also with the regulator. Blockchain, as we know,

[1] ORX – https://managingrisktogether.orx.org

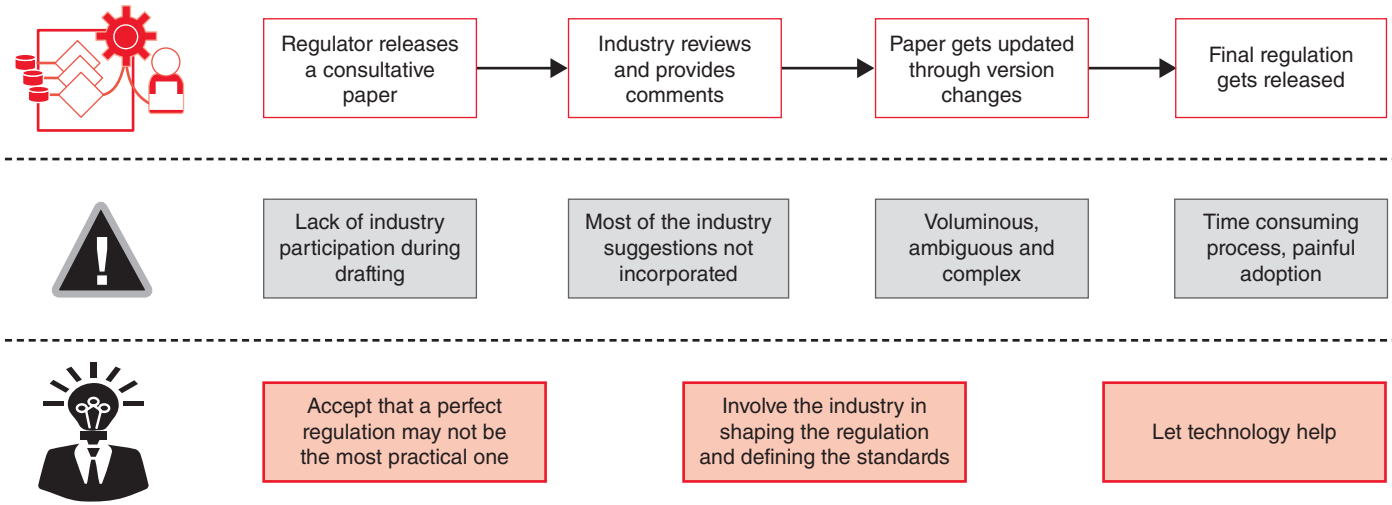

Figure 4: The genesis of compliance, issues in the current state, and ideas for improvement

creates records that are immutable. If a critical mass becomes available for a theme, e.g. for AML/KYC, blockchain can become the foundation for the utility. Digital identities and smart contracts can be further extensions to the concept.

Collaborating with the Regulators

Any discussion on compliance is incomplete without a mention of the regulator: it all starts and ends with the regulator. Until now, in many cases, the regulatory process has been a one-way street. Figure 4 maps out the current process a regulation goes through, the challenges in the current process, and what can be done to overcome the challenges.

The Technology Boost to Enable Collaborative Compliance

Through a technological lens, compliance can be seen largely as a logic program. This being the case, technology can be of immense help in all the three areas of collaboration discussed previously. Figure 5 depicts the future state of a compliance journey, the technology boost, and the realization of the three areas of collaboration for compliance.

Let's analyse the key features and benefits of the new age compliance journey.

At the very beginning, when the regulator conceives a new regulation, it is important that there be industry participation during the design and drafting process. This will make compliance practical and easy to implement for the participants. There are five steps:

1. *Automated ingestion*. For the financial institution, the journey towards the new compliance starts with the ingestion of the regulation into its environment. Automated ingestion will reduce the need for manual processes, thereby reducing costs and risks and increasing efficiency.
2. *Data lake*. The regulation can be stored in the data lake in digital form, which should be the central repository for all data and

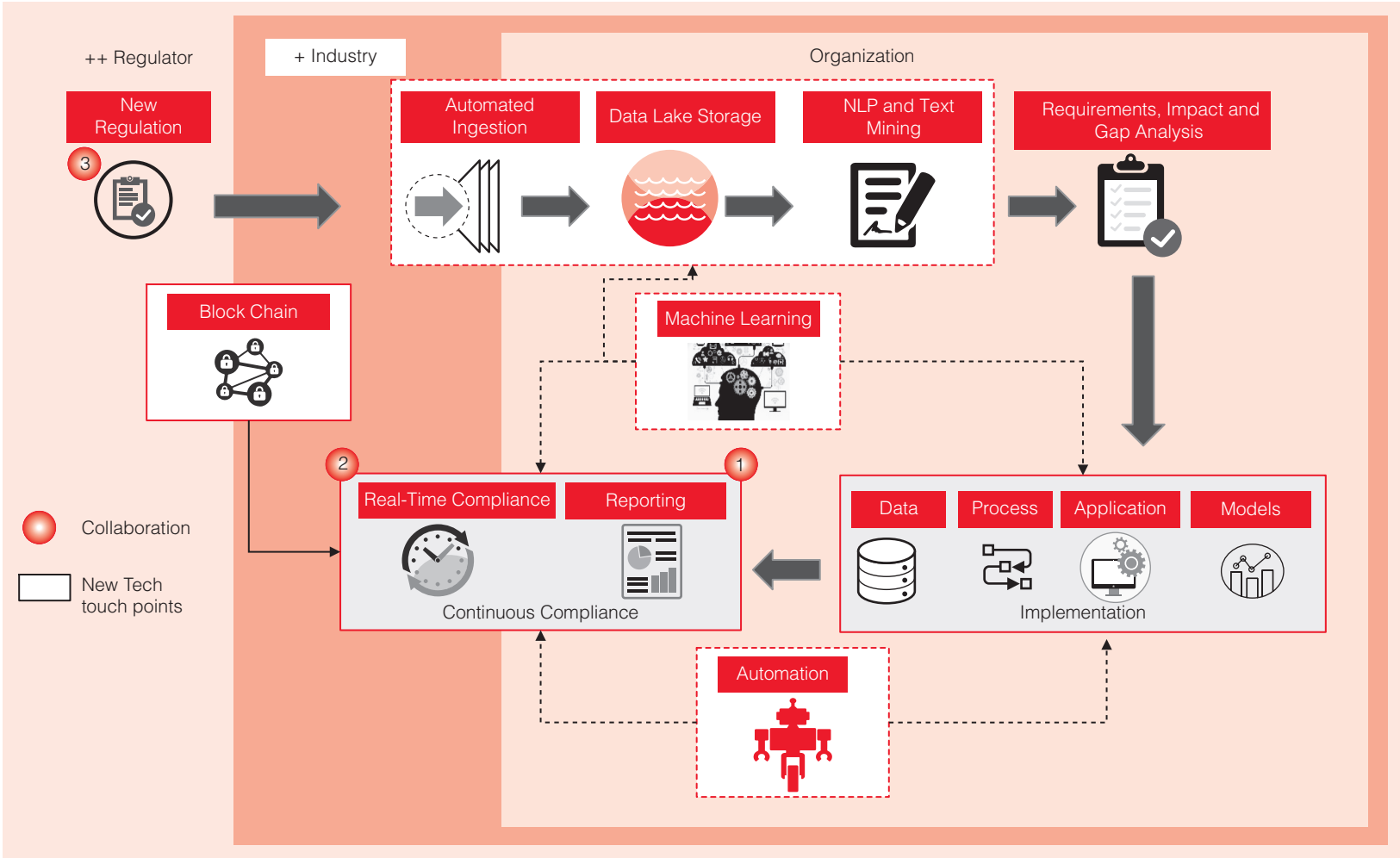

Figure 5: The next-generation compliance journey, powered by technology

regulations. The contents of the lake should be encrypted and have access control. Data lakes will act as a golden source of truth, ensuring safety and reduction of operational risks along with significantly reducing the total cost of ownership (TCO).

3. *Natural language processing (NLP) and text mining techniques*. NLP and text mining will read the information from the data lakes, define the taxonomy, and decode the compliance into a machine-readable, objective format. They can also help decrease the ambiguity prevalent in most compliances by creating regulation models and mapping them to business, process, and data models.

4. *Requirements, impact and gap analysis.* Capture can then follow and the information be captured in digital form on work flow systems.