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Financial RegTech: Opportunities and Obstacles

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A DECADE AFTER ITS ONSET, the global financial crisis' shadow still looms large over the financial industry. Although the markets have largely recovered, significant increases in regulatory burden have affected the profitability of most, if not all, financial institutions (FIs). After the onset of the financial crisis, regulators quickly began to implement new regulations, while more stringently enforcing existing ones. For example, in 2008, approximately 10 global regulatory changes occurred per day, yet by 2016, that number had surpassed 200, or one every seven minutes.

Struggling to keep up with the myriad of ever-changing regulations, FIs have been hit with heavy fines and aggressive consent orders. Since 2008, global regulators have levied over $321 billion in fines for regulatory violations. Despite rapid regulatory change and continued fines, for the first time in a decade, compliance staff hiring rates are expected to decrease.

What's changed? **RegTech**, or regulatory technology.

For most of the last decade, FIs responded to the increased regulation and oversight with traditional responses, countering increased regulation with increased resources, resulting in significantly inflated overhead.

By one estimate, global budgetary spending on risk and compliance activities reached $270 billion annually in 2016. Technological improvements were limited, with most FIs opting to make incremental improvements to legacy systems rather than wholesale changes. This is a somewhat natural response:

- Scaling budgets and staffs to meet increased regulation is the safest approach to avoid further exposure.
- In the current regulatory environment, there has been little tolerance for experimentation.

However, the tide appears to be changing.

A Regulatory Change Occurs

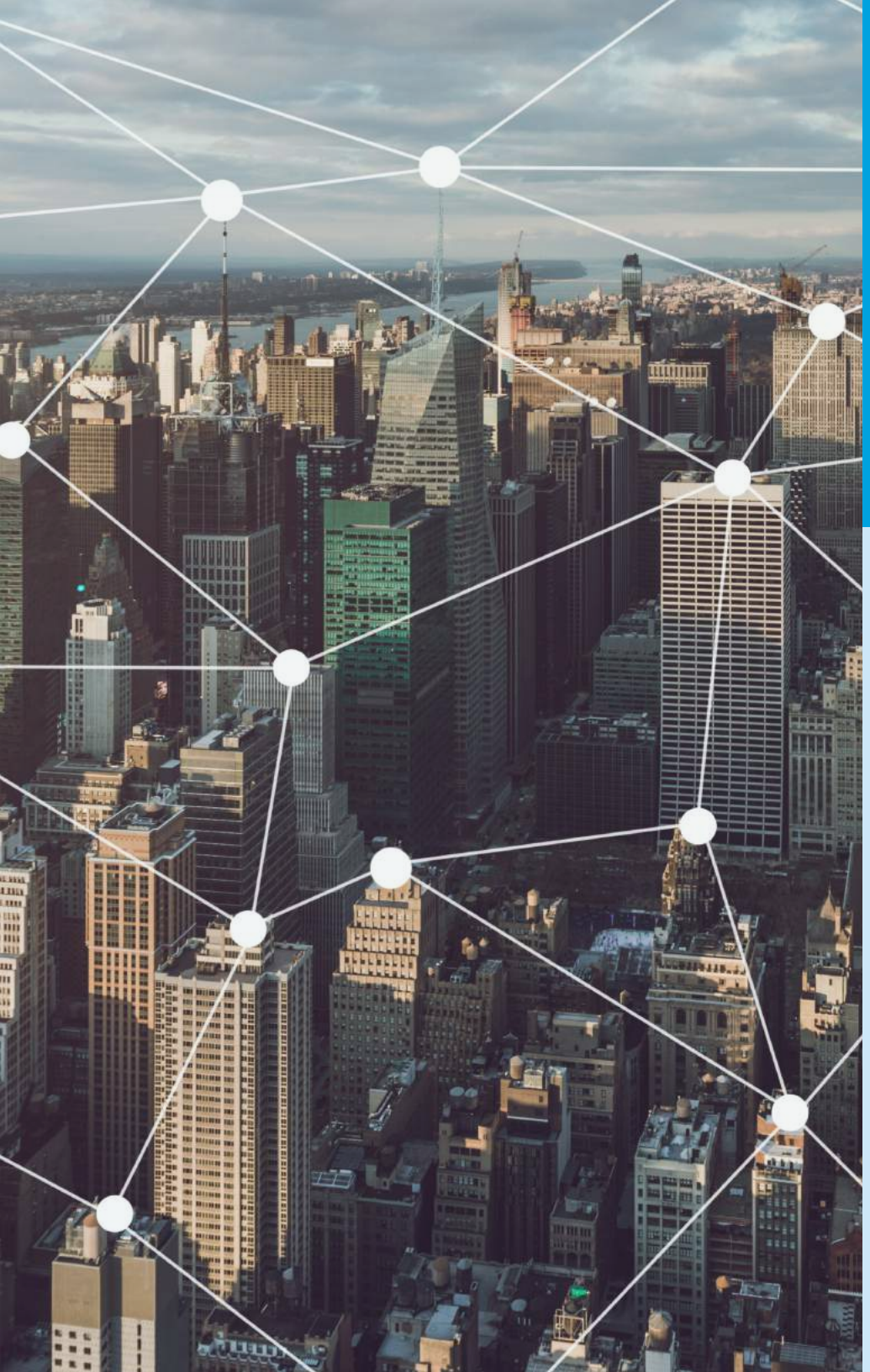
EVERY 7 MINUTES

2008 10 Changes Per Day

2016 200 Changes Per Day

$321 BILLION
Levied in Fines Since 2008

$270 BILLION
Spent on Risk and Compliance in 2016



of FIs reported a positive view of RegTech, up from 40% in 2016.

2017 Thomson Reuters survey of over 800 various FIs.

EMERGING TREND

With ever increasing regulatory burden, continued technological innovation, and regulators displaying an increased willingness to accept technological solutions, FIs are slowly but surely viewing RegTech as an effective tool to increase efficiency and rein in costs. As reported by Bloomberg, numerous prominent industry leaders, including Morgan Stanley President Colm Kelleher and Deutsche Bank AG CEO John Cryan, have gone on the record stating their expectation that the future of risk and compliance lies in technological improvement, rather than continued staff growth.

FIs appear to have finally caught their breath following the massive upswing in regulatory change and enforcement post-2008, and they've identified the adoption of RegTech as the logical future of business as usual (BAU).

SCOPE

Admittedly, regulatory technology is a somewhat broad term. FIs have been utilizing technology since their inception, and specifically digital technology since the 1980s. RegTech is a nebulous term, but it generally includes any technology which has achieved maturity and enterprise viability within the last two to three years, and has direct applications to the governance, risk and compliance industry. Moreover, RegTech is typically defined as disruptive - meaning it is a technological solution that completely overhauls and/or redefines how previous workstreams and systems function. For example, incremental improvements to customer onboarding software that has been in use since 2005 generally do not meet the definition of RegTech.

We will explore three specific applications of RegTech:

NATURAL LANGUAGE PROCESSING

Using natural language processing to keep up-to-date with regulatory change

ROBOTIC PROCESS AUTOMATION

Leveraging robotic process automation to significantly decrease manual compliance work

MACHINE LEARNING

Applying machine learning to transaction monitoring and fraud detection systems

There are certainly many other applications of RegTech, but the three chosen here are among the most promising, with the majority of FIs expected to implement them to some degree over the next few years.

OPPORTUNITIES

Monitoring New and Changing Regulations

A 2017 survey indicated that compliance officer's foremost concern for the year was the "volume and pace of regulatory change." Traditionally, FIs have been reliant upon both internal staff and external vendors to track regulatory changes and analyze their impact on existing organizational processes and norms. As previously stated, certain global FIs could be held liable for compliance with regulations that are changing every twelve minutes.

> These global FIs are subject to regulations from hundreds of regulatory bodies and need to monitor thousands of ever-changing rulebooks. It is almost impossible to apply a manual solution to this problem at any reasonable cost, and the historical reliance on labor-intensive monitoring and review of multiplying and ever-changing regulations is untenable.

Luckily, document and process reviews, which are key components of regulatory change management, were among the first domains where artificial intelligence (AI), and more specifically natural language processing (NLP) algorithms, were successfully applied. RegTech companies have been quick to embrace this technology, with their solutions capable of reading and reviewing multiple regulatory sources and automatically identifying and alerting FIs of any recent changes or additions.

Depending on the specific software, the solution can also automatically determine the relevant internal stakeholders who need to be alerted of the change, as well as analyze how the change may impact current internal policies and procedures. For example, efficient regulatory change management software may be able to automatically detect a change in a certain country's financial regulations and alert both the relevant country-level compliance officers in addition to any relevant global compliance staff. Certain RegTech companies already provide AI-based regulatory change management platforms, with some monitoring regulatory changes in over 180 countries and 60 languages.

Natural Language Processing

- Read and review regulatory sources
- Automatically identify and alert FIs of any changes
- Determine relevant internal stakeholders to alert
- Analyze impact to current internal policies and procedures

OPPORTUNITIES

Using Robotic Process Automation to Streamline KYC, CDD, and AML Workflows

For most FIs, Know Your Customer (KYC) and Anti-Money Laundering (AML) regulations have resulted in a laborious customer onboarding process. FIs typically require their front offices to collect and manually review numerous documents and enter relevant customer information across various systems. Back offices are simultaneously asked to conduct their own reviews and functions to ensure compliance and consistency. Once onboarded, customers require continuing Customer Due Diligence (CDD), resulting in similar labor-intensive processes to those used in onboarding. Collectively, these processes require considerable resource hours by both front and back office staffs and are exposed to the human error factor, which includes everything from simple typos to intentional process deviation.

Robotic process automation (RPA), sometimes referred to as robotics or digital labor, is a type of RegTech that provides FIs an effective alternative. Bots, the "workforce" of RPA, are software programs that follow defined internal business rules and policies and can be trained on essentially any repeatable process. By training bots to follow standardized compliance-related processes, FIs can improve efficiency, increase throughput, and reduce errors.

Common Usages for RPA

The most immediate use for bots is to input basic customer information across multiple systems. including information obtained from reviewing customer documentation. Utilizing advances in computer vision and natural language processing (NLP), bots can review customer documentation, extract and verify relevant information, and input this data wherever required, all without human involvement.

Screening automation is another promising area for RPA. Bots can search relevant systems, both internal and external, and then sort search results via basic heuristics such as name, location, and/or timeframe mismatches. FIs can tailor their preferred ambiguity threshold for mismatches, training bots to escalate potential mismatches or issues based on the programmed risk tolerance. Similarly, FIs can default their bots to escalate to a human reviewer when they encounter unique documentation or other unexpected instances, while also capturing the results of the human review so that future similar instances can be processed by the bot.

OPPORTUNITIES

Using Robotic Process Automation to Streamline KYC, CDD, and AML Workflows

By automating much of the onboarding workflow through bots, FIs can greatly reduce the amount of time spent dedicated to manual, repeatable processes. Additionally, RPA can help better meet quality standards by ensuring that every customer follows the same standard process without the risk of human error or deviation.

RPA is not limited to automating onboarding, however. As enforcement actions continue, FIs tasked with large-scale remediation or lookback efforts can effectively deploy RPA to more efficiently handle workloads and reduce their reliance on both external vendor staff and internal support staff. By design, enforcement actions generally require FIs to complete work either deemed incorrect or insufficient by regulators, and this work is equally manual. Rather than scrambling to identify external vendors, and the relevant internal employees needed to support them, FIs can utilize RPA to accomplish many of these same remediation tasks, significantly reducing costs and increasing productivity.

The key benefit of using RPA to address remediation issues is its ability to quickly reach targeted production and quality levels. Rather than relying on dozens or hundreds of individuals to gain the necessary domain and systems knowledge, RPA is reliant only on a small group of programmers to adapt the preferred RPA platform to the specific enforcement action requirements. Additionally, by using RPA to eliminate individual human error and deviation resulting in costly re-work and uplift, FIs can further reduce their chances of missing deadlines and possible further regulatory action.

Robotic Process Automation

- Efficiently handle workloads
- Reduce reliance on both external vendor and internal support staff
- Quickly reach targeted production and quality levels
- Reduce chances of missing deadlines and possible further regulatory action

OPPORTUNITIES

Improving Rules-Based Transaction Monitoring and Fraud Detection Systems with Machine Learning

Currently, most FIs take a rules-based approach for generating unusual transaction alerts and cases. This has resulted in significant volumes of false positives which require at least some level of investigation, with many FIs averaging 90 to 95% false positive rates of their total alerted transactions.

THIS APPROACH LOOKS LIKE THIS:

Compliance staff reviews previously alerted activity for trends and anomalies

They look for emerging suspicious patterns, as well opportunities to reduce false positives

Applying their expertise and experience, compliance teams make typically small, incremental adjustments, hoping to improve the efficiency of the alerts while staying within the FI's risk tolerance

THIS STRATEGY HAS MULTIPLE WEAKNESSES:

The rules are often arbitrary (e.g. alert all transactions within a certain dollar range)

They are reliant on internal expertise and experience and therefore may miss lesser known or new typologies

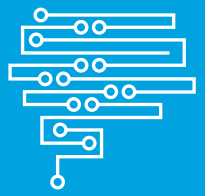
They are slow changing, with only incremental changes to rules typically spaced months to years apart

OPPORTUNITIES

Improving Rules-Based Transaction Monitoring and Fraud Detection Systems with Machine Learning

With such inefficiencies, even marginal improvements will result in significant savings, both in investigative time and overall compliance spend. To tackle this problem, firms have begun implementing machine learning solutions, with most focusing on supervised machine learning algorithms as their starting point. By training supervised algorithms on prior alerted activity, FIs can fine-tune rules to reduce the number of false positives. Instead of relying on cumbersome periodic reviews, feedback loops - which include all reviewed transactions - will allow supervised algorithms to compare current rules and investigatory results, using the delta to make recommended changes. This process runs continually in the background, and as the delta decreases and the FIs become more confident in the supervised algorithm's recommendation, the pace of rule refinement can increase accordingly.

For more innovative FIs, utilizing unsupervised machine learning algorithms offers even more promise. As opposed to supervised algorithms that are trained on previous alerted activity and pre-existing rules, unsupervised algorithms (or at least those most applicable to FIs) operate by reviewing vast quantities of data, grouping transactions and alerts based on similarities and other patterns in a process known as clustering, without any prior inputs. Unbiased by existing rules, an unsupervised algorithm represents the most effective tool for identifying new patterns and typologies. For example, an unsupervised algorithm may identify a subset of transactions between two specific geographies which were remitted in amounts and frequencies of unusual consistencies, even if no pre-existing rule would have alerted this activity.



Machine Learning

- Compare current rules and investigatory results
- Reduce the number of false positives
- Group transactions and alerts based on similarities
- Make recommended changes

OPPORTUNITIES

Solution Maturity

To be clear, the solutions outlined in this ebook are not yet mature. To reach their full capabilities, further research, testing and overall progress is still required. It is also important to note that as of now, RegTech is not typically intended to fully replace all human involvement in the relevant risk and compliance processes. RegTech is ideal for eliminating low-level, repeatable, manual processes, however, existing technologies are not sufficient to replace more ambiguous and complex decisions. In truth, a certain level of human monitoring of RegTech solutions will always be required. The ideal future-state FI will have implemented RegTech to replace most if not all its manual, repeatable risk and compliance processes, and will have freed up its streamlined compliance staff to conduct more meaningful, targeted work. Overall, RegTech adoption is more a matter of when, not if, and represents opportunities for substantial cost-savings and process streamlining.

In fact, the adoption of RegTech is nearer than many may think, and midsize banks may represent the most promising audience for adoption.

Facing traditional competition from Global Systemically Important Banks ("G-SIBs") as well as emerging competition from smaller FIs, midsize banks possess a unique combination of sufficient resources to develop and implement large-scale technical solutions while still being small and agile enough to clear the internal hurdles necessary to implement such solutions. Examples cited by IIF of midsize banks adopting RegTech include Capital One's work with machine learning to apply their skillsets to combating fraud, as well as SunTrust's and Bank of Montreal's collaboration with RPA providers to streamline KYC processes.

Midsize Banks

The Institute of International Finance (IIF) concluded in November 2016 that midsize banks, which it defined as FIs with assets between approximately $100 - $500 billion, were leading the industry in RegTech innovation

CAPITAL ONE
Leveraging machine learning algorithms to combat fraud

SUNTRUST AND BANK OF MONTREAL
Collaboration with RPA providers to streamline KYC processes

OBSTACLES

Regardless of size, the adoption of RegTech by FIs will face many hurdles. The most immediate will be convincing both senior executives and regulators that RegTech can truly decrease risk and improve compliance. In a regulatory environment traditionally reliant on tiered staff review, arguing for the removal of direct human involvement in many processes will be an uphill battle. For many FIs, the lack of staff review previously resulted in enforcement actions and massive fines; convincing these same institutions to essentially "trust the machines" will require time and effort.

To help facilitate the adoption of RegTech solutions, a multi-faceted approach is necessary.

> RegTech providers need to continue to prove the safety and strength of their products, FIs need to be willing to trust their technology, and most importantly, regulators will need to provide positive indications that they are willing to accept sufficiently-tested technological solutions.

Regulators could indicate their acceptance in multiple ways, including publishing specific, proactive guidance, standards and rules for the use of technology in the regulatory and compliance sphere, and collaborating with FIs on technological solutions as they address existing deficiencies and enforcement actions.

OBSTACLES

Regulators

Although so far regulators have not been overly forthcoming with specific approvals or guidance for the use of technological solutions, there is some indication that they are becoming increasingly aware and comfortable with the use of RegTech.

> For example, the UK's most prominent financial regulator, the Financial Conduct Authority, published a Call for Input in late 2015, asking for specific input as to how it could support FIs in their adoption of RegTech.
>
> In the spring of 2017, the Office of Innovation within the Office of the Comptroller of the Currency (OCC) held one-on-one meetings with FIs on the subject of "Responsible Innovation" as a part of its Office Hours program.

Although the outcomes of these dialogues are unclear, the mere fact that these conversations are occurring provides hope that regulators are increasingly becoming more comfortable with technology in risk and compliance. The Treasury Department's recent recommendation supporting the creation of a consistent "regulatory sandbox" framework, which would allow FIs to test new technologies in a controlled environment while regulators develop appropriate regulations, is another step in the right direction.

Additionally, some regulators are even looking at using RegTech themselves. The most prominent is the Securities and Exchanges Commission (SEC). The SEC first experimented with RegTech by employing NLP algorithms in the review of tips, complaints, and referrals (TCR) data, looking for undiscovered patterns. Following their success with reviewing TCR data, the SEC first utilized NLP algorithms to identify commonalities in disclosures produced by firms charged with wrongdoing, resulting in the discovery of consistent language patterns which could be applied to future disclosures. The SEC has since spread its use of NLP algorithms to review investment advisor prospectus.

In a speech on the SEC's use of RegTech, Scott W. Bauguess, former SEC Acting Director and Acting Chief Economist, stated, "The results are impressive. Back-testing analyses show that the algorithms are five times better than random at identifying language in investment adviser regulatory filings that could merit a referral to enforcement."

"Better than random" may seem like a low threshold, but it is also the reality SEC analysts face. Without assistance from NLP algorithms, they have no way of knowing whether an unreviewed filing contains suspicious language. Implementing NLP algorithms allows the SEC to conduct more targeted reviews.

REGULATORY BUY-IN

While noting that humans would always be involved in reviewing the findings of RegTech, Bauguess goes on to conclude:

"I can see the evolving science of AI enabling us to develop systems capable of aggregating data, assessing whether certain federal securities laws or regulations may have been violated, creating detailed reports with justifications supporting the identified market risk, and forwarding the report outlining that possible risk or possible violation to Enforcement or OCIE staff for further evaluation and corroboration."

OBSTACLES

Resources and Scale

Another hurdle, particularly for G-SIBs, is the sheer amount of work inherent with implementing large-scale technological solutions. To begin, any technological solution requires significant testing before it is even considered for implementation. Once a solution is identified, tested, and approved, the work of reconciling numerous legacy systems begins. Because these systems may be very outdated, this could prove to be an arduous process. Moreover, as anyone who has worked for a G-SIB is aware, the multitude of departments and lines-of-businesses will likely have their own processes and procedures which will also need reconciliation and standardization.

> **"Even though investments in RegTech were identified as generating ROIs of up to 600%, there's a big shortage [of talent] in artificial intelligence, machine learning and blockchain."**

While this work may prove burdensome, the initial results of implementing RegTech solutions have more than justified the initial costs. By adopting RegTech, FIs will be able to rein-in ever-growing costs, streamline workflows and organizational structures, reduce risk, and increase compliance. In one report by Medici, investments in RegTech were identified as generating ROIs of up to 600%, often paying off the initial investment within three years.

The last significant hurdle FIs face is the current lack of a sufficiently skilled workforce. Although FIs employ large staffs of both compliance officers and technology professionals, for most, only a small minority of individuals in these groups have expertise in both domains. To obtain and maintain regulator buy-in for RegTech solutions, FIs need individuals capable of demonstrating to regulators a strong understanding of how their solution functions from both a technical and risk and compliance standpoint. For example, FIs that implement machine learning in transaction monitoring systems need individuals who can sufficiently explain to regulators how their machine learning algorithms work, why the algorithms alerted certain activity, and how the FI tested and validated the algorithms' results.

As Richard Burgess-Kelly, founder of RegTech recruiting firm Liberam stated, "There's a talent shortage in the network...There's a big shortage [of talent] in artificial intelligence, machine learning and blockchain."

SOLUTIONS

Balanced Consulting Approach

IBM demonstrated the need for the combination of regulatory and technical expertise when it purchased influential regulatory consulting firm Promontory Financial Group for approximately $300 million in 2016. Promontory was purchased for the sole purpose of partnering with IBM's existing Watson AI platform, and this combination provided IBM with a viable go-to-market strategy for breaking into the RegTech industry. Yet for FIs not planning to acquire a consulting firm to solve their talent gaps, individuals with the requisite regulatory and technological expertise are in high demand and short supply.

To address this talent shortage, FIs will have three primary options: train and upskill their current workforce, contract outside firms to assist with the implementation of RegTech, or wholly outsource certain processes/functions.

UPSKILLING

Upskilling will produce the longest lasting results, as it will result in a trained, long-term internal workforce. Additionally, the experience gained while upskilling will prove valuable for addressing future opportunities and obstacles. However, upskilling is a lengthy process, requiring significant investments in training and hiring. For many FIs, their risk and compliance problems are urgent, and many FIs simply do not have the ability to wait until their workforce has been sufficiently upskilled before solving problems.

CONTRACTING IMPLEMENTATION

For more immediate results, FIs are likely to turn to outside firms, including consulting firms and external technology providers, who already possess the requisite knowledge to quickly integrate RegTech with existing internal procedures and systems. Outside firms can be tasked with the implementation of short to medium-term solutions, while the FI can leverage the outside firm's expertise to assist with the upskilling process and growth towards long-term sustainability.

OUTSOURCING

Lastly, FIs will likely determine that certain processes and functions are sufficiently simple and standard enough to wholly outsource to existing RegTech providers. By doing so, FIs forgo the ability to maintain expertise in and day-to-day direct supervision over the outsourced processes and functions, but this approach can also free up resources for more mission critical items.

In truth, most FIs will leverage a hybrid approach, outsourcing what they can, bringing in third parties to provide short to medium-term solutions, while simultaneously upskilling internal staff for long-term functionality. This is supported by a Thomson Reuters 2017 study that found that 41% of FIs would use a mixed approach to RegTech adoption, compared to 22% that planned to handle this work entirely internally and 20% which would exclusively outsource. Going it alone or entirely outsourcing have their advantages, but the balanced approach of upskilling internal resources for long-term sustainability while leveraging the existing experience and knowledge of outside firms to implement short to medium-term solutions will produce the most valuable results.

CONCLUSION

Regardless of the specific RegTech applications financial institutions choose to implement, RegTech offers the most scalable and effective solutions to combatting increasing regulatory change and enforcement. This is not to say the compliance officer will disappear. RegTech still has its shortcomings, and regulators are unlikely to ever trust an entirely automated solution for managing key regulatory risks. Despite this, further significant growth in compliance staffs is financially undesirable, and companies have already begun investing in technology to offset this burden.

The implementation of natural language processing algorithms to monitor regulatory change, leveraging robotic process automation to significantly decrease manual compliance work, and applying both supervised and unsupervised machine learning algorithms to transaction monitoring and fraud detection systems represent just some of the many possibilities of RegTech.

We should not ignore the obstacles that need to be overcome. Regulators still need to be convinced, financial institutions still need to work through the inherent difficulties of updating legacy systems, and the shortage of a sufficiently skilled workforce will still need to be addressed. But given RegTech's promise of cost reduction, process streamlining, increased risk mitigation, and better talent utilization, the future is bright, and in reality, there are few alternatives.

As Ed Sibley, director of Credit Institutions Supervision, Central Bank of Ireland said in March 2017,

> **"We need to be alive to the disruptions that are coming, to be flexible and adaptive and recognize that successful implementation of new technologies can drive significant efficiencies and greater robustness."**

With efficient and responsible implementation of regulatory technology, financial institutions will be able to reduce regulatory burden, better allocate internal compliance resources, and improve overall internal compliance.

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Owen is a project manager and business analyst in our Charlotte, NC office with experience on risk and compliance-related projects, as well as with leading teams on internal tech challenge projects. On his client project work, Owen has experience with process mapping and improvement, reporting, ad hoc analysis, issue resolution, as well as stakeholder management, and has served as a team lead for multiple analysts. On his internal work, Owen has served as the primary project manager as well as business analyst on two innovation challenge (machine learning and augmented reality) teams, as well as serving as the primary project manager for the Risk and Compliance service offering.

How CapTech Can Help

CapTech provides business and technological solutions that address the risk and compliance issues facing regulated financial, healthcare, and other industries. Our consultants have successfully completed a number of complex risk, compliance, and AML projects for a myriad of clients including multiple Fortune 100 organizations.

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