



The nexus between regulation and technology innovation

**How financial services firms can gain
greater strategic advantage, reduce cost,
and harmonize coordination**

Part one of a series on the power of
RegTech solutions

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Introduction

In today's fast-paced and rapidly changing environment, the financial services industry is challenged to find innovative ways to reach strategic growth objectives, further reduce compliance cost, and ensure effective management of regulatory change. As the industry transitions from eight years spent focusing on cost containment, remediation, and new regulations in a low interest rate environment, firms are now putting greater emphasis on their growth agenda. This includes acquisitions, new product development, cross-selling products and services, and improving customer service, which have all re-emerged under a digital technology lens as the industry's highest priority. Regulators and central banks are also seeking ways to leverage new technologies to meet public policy objectives and complex supervisory requirements. For many organizations, leveraging technology is the answer.

While Financial Technology (FinTech) has become a core focus for all financial services players over the past decade and many banks have established their own labs, formed partnerships, and taken FinTech companies into residence programs, the focus is now zooming in on Regulatory Technology (RegTech) solutions. Why is that so?

RegTech brings benefits to the financial services industry

With industry-wide compliance cost ballooning to an estimated \$70 billion annually in the United States alone, RegTech solutions have proven to be the accelerator that helps firms respond to increased regulatory expectations while reducing compliance cost, increasing enterprise-wide coordination, and making firms' business strategies more agile.



Greater Strategic Advantage

from better customer experience, new product development, real-time compliance, and agility



Harmonized Coordination

through improved functioning across the three lines of defense and enterprise-wide data management as well as embedded ownership of risk management and compliance processes and controls into the first business line



Reduced Cost

by cutting compliance expense an estimated 30 to 60 percent due to streamlined and simplified operations and reduced headcount spend

RegTech solutions provide the ideal platform for supporting the industry's strategic growth agenda, accelerating their speed to market, and optimizing business processes while meeting regulatory standards. These solutions provide a way to first connect business processes with the labyrinth of complex regulatory obligations and then streamline and simplify these mandates into manageable processes that firms can implement effectively and relatively quickly. This will allow firms to deliver enhanced control over their enterprises' activities, which, when combined with an appropriate risk culture, ultimately culminates in better protection from reputational damage and improved enterprise risk governance. Additionally, these solutions use the power of automation to reduce headcount spend and other compliance-related cost. For instance, compliance can be improved by limiting manual intervention and taking advantage of non-biased technology to accomplish certain fundamental processes.

Eighty-five percent of CEOs recognize the importance of integrating automated business processes with artificial intelligence and cognitive processes.

(Source: KPMG International's 2016 Global CEO Outlook Study)



The drivers behind RegTech solutions

Exponential growth in regulatory requirements over the last eight years, including a renewed consumer protection agenda and a demand for faster remediation of supervisory issues, has added to the cost of operationalizing compliance across the three lines of defense of enterprise risk management and resulted in increased resource spend. For instance, firms have invested heavily on the business side to develop consistent methodologies, enhance data lineage, and implement risk identification. The industry's approach to compliance has amplified the need for end-to-end tools and platforms capable of automating and integrating front-to-back operations with compliance requirements that will ultimately drive accountability into the first line.

As firms continue to make technological advancements that enhance customer experience and increase convenience, the industry is looking for practical and more effective ways to take advantage of "big data"—customer, risk, financial, operational, and more—that holds the potential to address many of these compliance concerns. However, managing these data efficiently, manipulating it

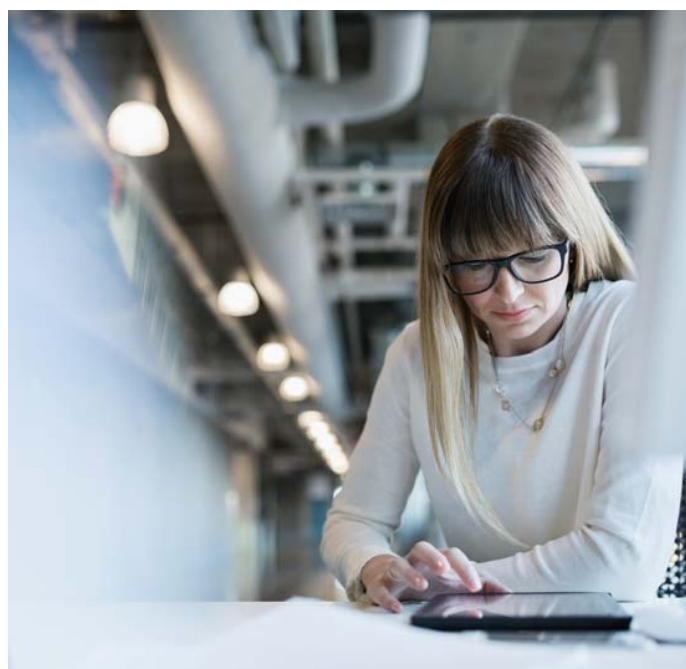
effectively to serve a variety of purposes, and ensuring it is protected from cyber-attacks and of sufficient quality to yield actionable results remains elusive. Human biases and other limitations in managing big data's multiple sources, volume, and complexity, while unavoidable, have only served to exacerbate these concerns. Although significant cost and effort has been expended, many firms still find themselves in noncompliance with regulatory obligations which has led to substantial fines and considerable reputational damage.

RegTech solutions assist firms in moving away from the concept of big data towards one of "smart data." Smart data uses machine learning and intelligent algorithms to make sense of big data's overwhelming volume and complex patterns by structuring these patterns in a cost-effective way that is better able to identify current and emerging risks, predict compliance failures, and enhance business line coordination. Amidst significant business model disruption from increased competition and the rapid pivot toward growth objectives, it is critical that many of the manual processes firms' have relied



upon are automated to promote agility, scalability, and enhancements to customer and employee experiences.

Increased competitive pressures from various market players, new entrants, and idiosyncratic customer demands for an improved delivery experience are also driving a need for agility in firms' business processes and their ability to simultaneously achieve real-time compliance. To address this, many banks have either purchased or partnered with FinTech startups to support these key functions, assist in developing a lower-cost operating model, and provide technological innovations in financial product and service development. This trend is expected to continue for the foreseeable future as more banks consider their options. As profitability continues to improve and technologies become more scalable, the industry will likely continue attracting additional FinTech competitors and smaller institutions will likely consider following the lead started by larger firms of establishing their own internal technology hubs designed to foster innovation in product development and provide agile platforms to support growth.



Eighty-four percent of CEOs are concerned about the quality of the data they base their decisions on.

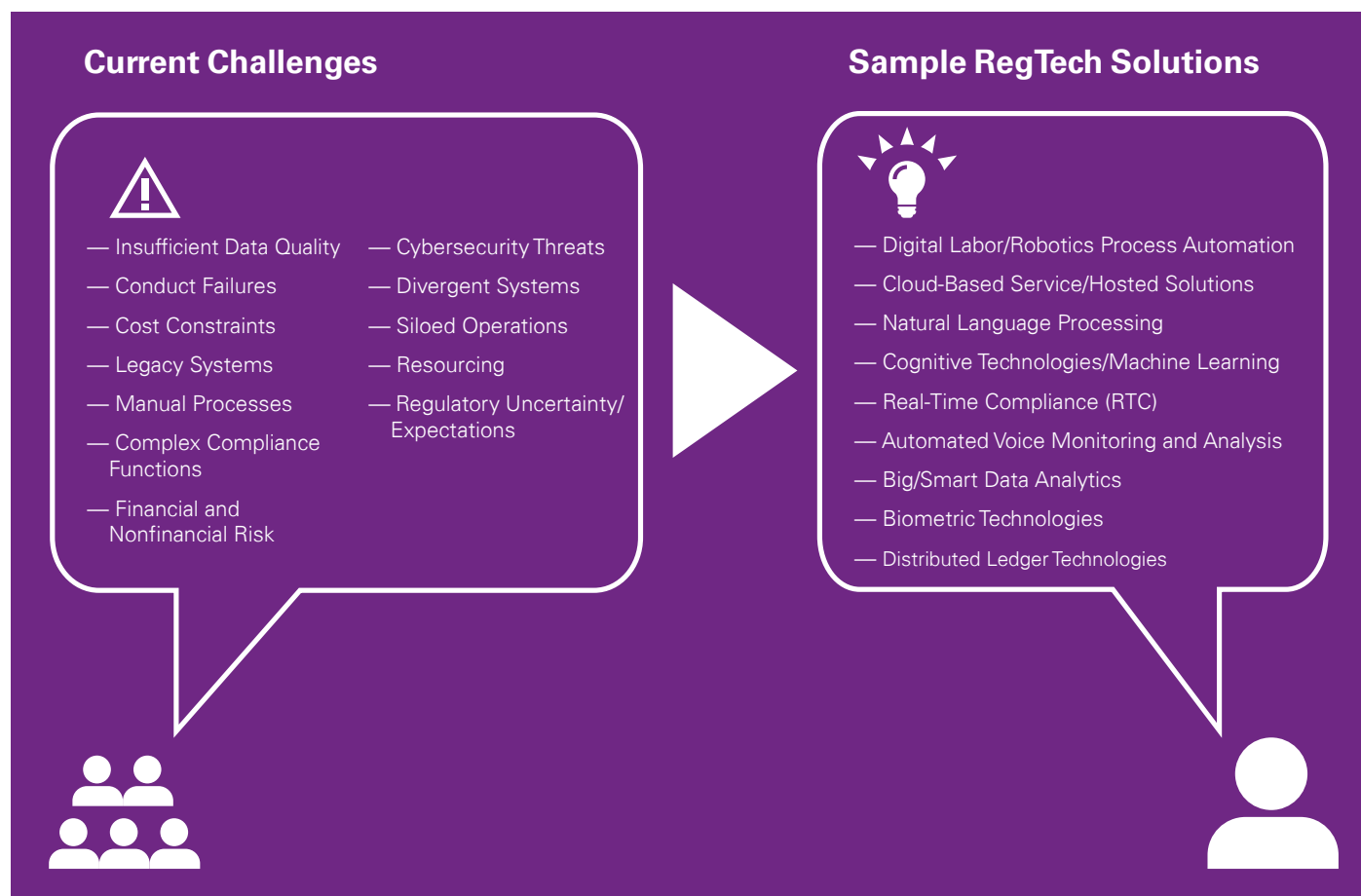
(Source: KPMG International's 2016 Global CEO Outlook Study)

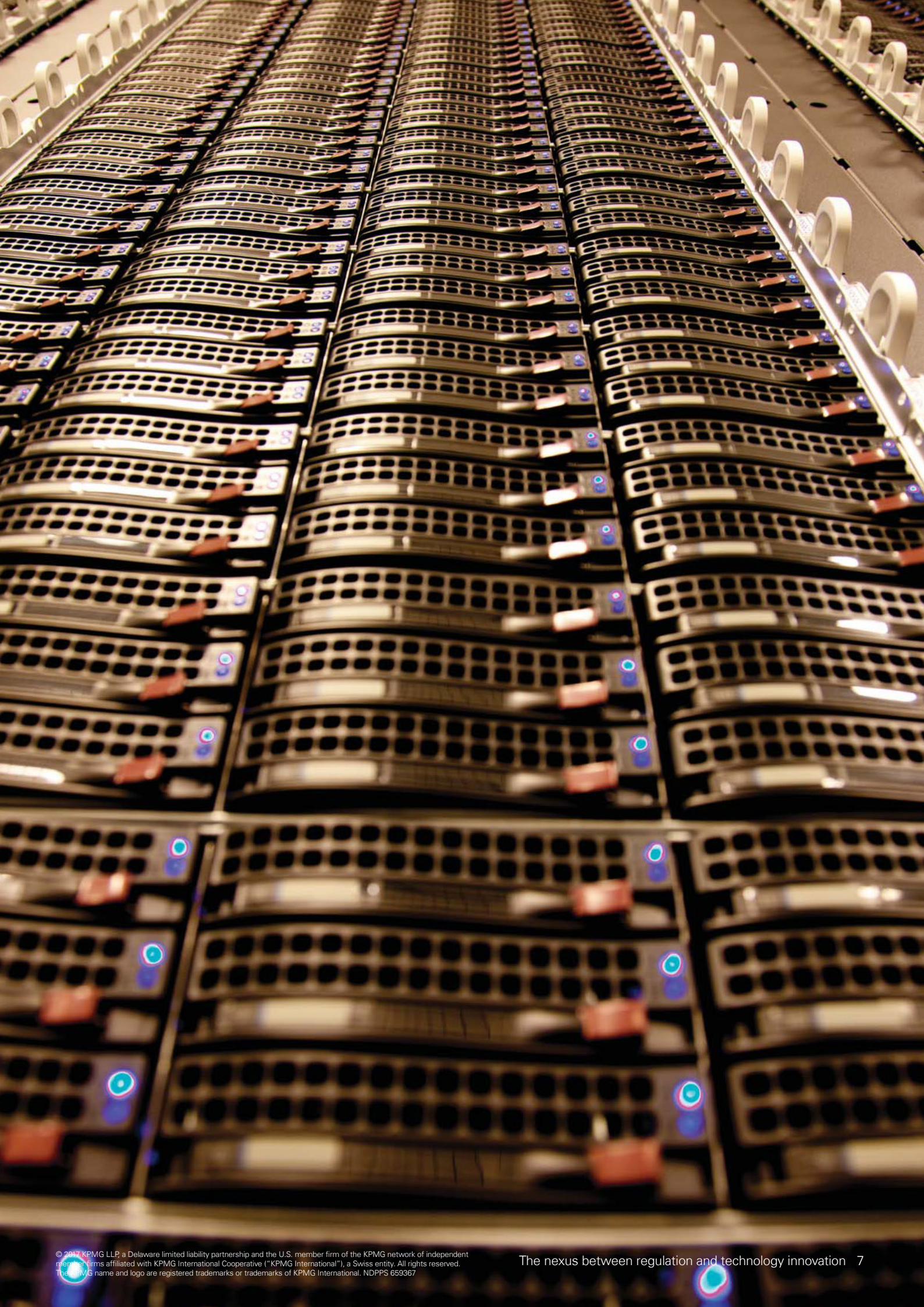
CEOs believe technology will be one of the biggest factors contributing to company growth, second only to economic factors.

(Source: KPMG International's 2016 Global CEO Outlook Study)

Leveraging emerging technologies to address challenges facing financial institutions

Forward-looking institutions are looking at the end-to-end regulatory compliance ecosystem and how best to automate disparate processes and controls to realize greater strategic advantage. Institutions are also marrying technology and regulatory requirements to address issues more efficiently and respond more rapidly to changing customer preferences and supervisory mandates.





The business benefits of enabling technologies

Regulatory automation tools are at the forefront of addressing many of the most pressing challenges facing financial institutions. As compliance, including conduct and reputational risk, remains on the agenda of regulators across the globe, RegTech solutions are also helping firms to better identify, monitor, and mitigate behavioral risks through the use of smart data, cognitive machine learning, and natural language and robotics processing for the benefit of customers. For instance, these solutions can assist firms with new account growth that does not lead to credit quality concerns, violate U.S. Bank Secrecy Act/Anti-Money Laundering (BSA/AML) compliance program requirements, or incur reputational damage to the firm. Additionally, as firms enhance their cyber strategies, these solutions can improve resiliency by reducing dependency on low-cost outsourced providers who often have inconsistent security standards and other vulnerabilities that are not readily controlled.

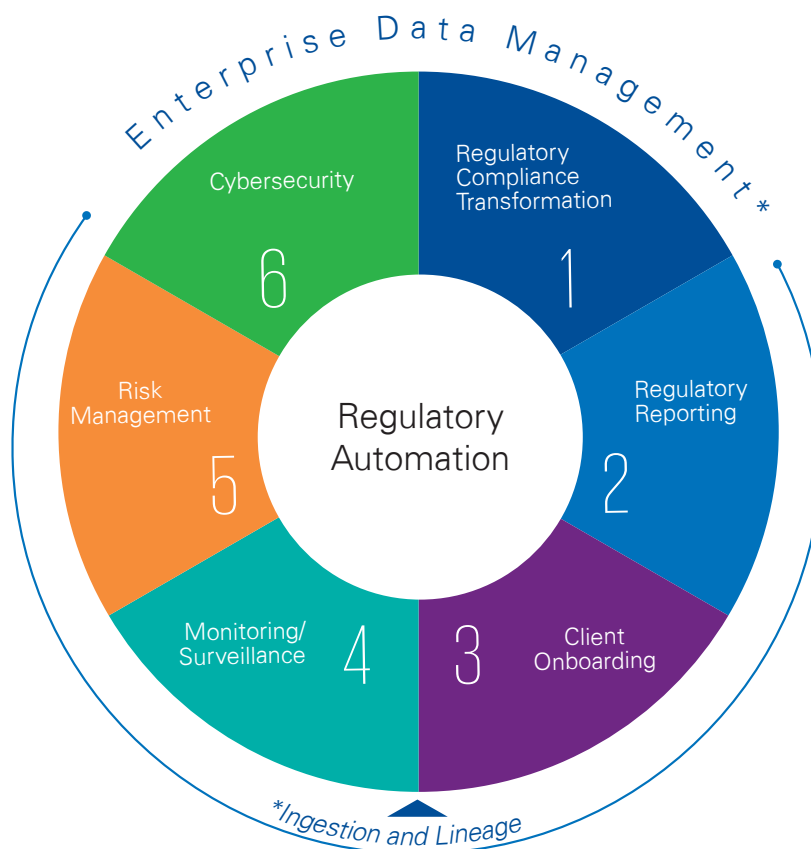
Significant benefits to the business can also be realized with the implementation of RegTech solutions that are automating regulation in ways that support and foster firms' business and growth strategies. For example, big/smart data technologies can be used to efficiently process large volumes of structured and unstructured data from both proprietary systems and the Internet of Things' vast external sources. Relevant data from multiple sources can be leveraged for better customer and counterparty credit analysis and underwriting of small business loans. Firms can leverage digital labor solutions to onshore certain functions and reinvent their labor strategies across their enterprises, potentially reducing cost and mitigating sourcing risk. For example, global firms impacted by the United Kingdom's June 24, 2016, Brexit vote, could consider digital labor solutions to provide some relief to more restrictive passporting rights that are projected to further reduce the available pool of information and

communications technology (ICT) professionals.¹ Similarly, in the United States, firms might potentially incorporate these solutions to rapidly implement relevant components of the new administration's proposed corporate income tax reform.

Ultimately, if implemented correctly, RegTech solutions will lead to reduced errors, improved compliance, and enhanced financial crime detection and fraud surveillance. They will also work in concert to deliver enhanced digital experiences for customers and significant cost optimization and efficiency opportunities by reducing manual processes and human biases. While not eliminating human capital spend entirely, firms can nevertheless focus redeploying fewer, highly-skilled compliance resources away from routine processes and towards analyzing output and applying critical judgment to this machine reporting.

¹ See the 2016 EU Digital Scorecard, which states that "demand for skilled ICT professionals within the [United Kingdom's] economy is rising rapidly, while the supply is not keeping pace."

Regulatory Automation Key Components



Sample Business Concerns

Enabling Technologies

1	<ul style="list-style-type: none"> — End-to-end Regulatory Ecosystem: <ul style="list-style-type: none"> — Horizon scanning — Compliance automated monitoring and testing — Regulatory reporting — Consumer protection 	<ul style="list-style-type: none"> — Digital labor/robotics process automation — Intelligent Business Process Management Suites (iBPMS), workflow tools — Machine learning — Cognitive technologies — Automated voice monitoring and analysis — Biometric technologies
2	<ul style="list-style-type: none"> — IFRS 9/Current Expected Credit Loss (CECL) standard — Foreign Account Tax Compliance Act (FATCA) — Stress testing/capital planning (e.g., CCAR/DFAST reports) — Liquidity reporting — Common Reporting Standard (CRS) — Automated data aggregation, analytics, and reporting (BCBS 239) 	<ul style="list-style-type: none"> — Digital labor/robotics process automation — iBPMS, workflow tools
3	<ul style="list-style-type: none"> — BSA/AML + account openings — Know Your Customer (KYC) + fraud prevention and detection — FATCA + due diligence — CRS — Customer service advantage 	<ul style="list-style-type: none"> — Digital labor/robotics process automation — iBPMS, workflow tools — Natural language processing — Big/smart data analytics — Distributed ledger technologies
4	<ul style="list-style-type: none"> — Transaction monitoring — Fraud prevention and detection — Transaction surveillance — Employee surveillance — Risk monitoring 	<ul style="list-style-type: none"> — Digital labor/robotics process automation — Big/smart data analytics — Machine learning — Cognitive technologies — Real-time compliance
5	<ul style="list-style-type: none"> — Application score cards — Risk models — Controls automation — Risk analytics: credit, collections, fraud, portfolios, stress testing, balance sheet, liquidity — Enhanced coordination across the three lines of defense — Centralized risk management — Conduct/culture outcomes — Credit risk/underwriting standards 	<ul style="list-style-type: none"> — Machine learning — Cognitive technologies — Natural language processing — Digital labor/robotics process automation — Big/smart data analytics — iBPMS, workflow tools
6	<ul style="list-style-type: none"> — Threat monitoring and surveillance — Cyber risk analytics — Third-party and IT vendor risk — FinCEN Suspicious Activity Report (SAR) filing process coordination — Cyber-resilient frameworks 	<ul style="list-style-type: none"> — Cognitive technologies — Big/smart data analytics — Real-time compliance

Global regulatory perspectives

Regulators across the globe are increasingly recognizing their role in fostering innovation, with many countries competing to either cement their position as a leading world financial center or disrupt the market's status quo. Countries such as Singapore and Australia are competing with regulators in the United Kingdom and the United States to take a leading role in encouraging the development of RegTech solutions through learning labs, direct funding, and "regulatory sandboxes." RegTech solutions also offer the potential to

reinvent and streamline approaches to the regulatory and supervisory process itself through the use of real-time surveillance, distributed ledger technologies (blockchain), and data analytics. For financial institutions, implementing RegTech solutions that lead to improved data protection and quality, customer suitability standards, and audit trails may engender a favorable supervisory response. Additionally, regulators are beginning to provide clearer guidance around outsourcing requirements and privacy laws related to cloud computing

use and other related technologies, which will likely shape new industry standards and further enable implementation of these initiatives. There may also be a potential role for other governmental entities outside of the traditional financial services spectrum to support financial innovation. For example, in the United States, the Department of Commerce or other bureaus within the Department of Treasury may consider ways to foster innovation to achieve a mission of economic growth.



As regulatory authorities and central banks stake out their positions

Examples abound worldwide of transformative initiatives intended to support the creation of a vibrant ecosystem for financial innovation.

Regulatory Sandboxes	Direct Sovereign Funding	Legislative Proposals	Regulatory Agency Frameworks	Payment Systems Infrastructure	Regulatory Modernization
<ul style="list-style-type: none"> Regulatory sandboxes that allow firms to test innovations, such as products, services, business models, and delivery mechanisms, in a live environment have sprouted up in the United Kingdom, Hong Kong, Singapore, and Australia and may serve as a template for financial innovation in the United States. 	<ul style="list-style-type: none"> The Monetary Authority of Singapore's Financial Sector Technology & Innovation Proof of Concept scheme provides funding intended to promote experimentation within the financial services sector. 	<ul style="list-style-type: none"> Proposals in the United States, such as the Financial Services Innovation Act of 2016 (H.R.6118), are being introduced to support the development of financial innovations, reduce the time and cost of financial innovation offering to the public, enable greater access to financial innovations, and encourage greater coordination and information sharing across the regulatory agencies. 	<ul style="list-style-type: none"> The Consumer Financial Protection Bureau's Project Catalyst program to encourage consumer-friendly innovation by providing a platform for firms to identify ways to build consumer protections into emerging products and services at the outset. The Office of the Comptroller of the Currency's Responsible Innovation Framework, which seeks to improve the agency's ability to identify, understand, and respond to financial innovation affecting the federal banking system. 	<ul style="list-style-type: none"> The Federal Reserve Board is assessing both the potential risks and benefits of distributed ledger (blockchain) technology that could dramatically improve payments, clearing, and settlement systems. 	<ul style="list-style-type: none"> The Securities and Exchange Commission and the Financial Industry Regulatory Authority are examining ways to provide an environment for investors and the markets to benefit from financial innovations by ensuring regulations keep pace with these advancements and exploring technological enhancements, such as artificial intelligence, to systems designed to identify wrongdoing among market participants.

Leveraging RegTech solutions: where do you go from here?

Determining where you want to be and what it will ultimately cost to get there is fundamental to the success of any firm. To take advantage of the many benefits of implementing RegTech solutions and realize their hidden value as a core component of business processes and controls, firms should consider the following:

- Initiate proactive discussions with regulators to foster engagement and explain innovations in process improvements and product and service development at the outset.
- Assess existing and emerging technologies within the firm to determine functionality and critical interdependencies across the three lines of defense.
- Determine strategic linkages and options for implementing effective RegTech solutions, including deciding whether to build, buy, or team with RegTech and FinTech providers.
- Take advantage of the ability of a given RegTech solution to be implemented quickly and relatively easily end-to-end or at multiple points in the value chain of an enterprise to target specific bits of complexity.

Perhaps just as critically, firms will also need to consider the unintended risks that are always embedded in any transformative solutions. As firms adopt these advances, they must continue to address potential

risks, such as algorithmic biases and insufficiently robust data- and cyber-security measures, as well as risks associated with ongoing validation and change processes. Firms will need to embed their risk and compliance frameworks upfront in the design phase of their RegTech initiatives and then revisit its effectiveness continuously throughout the lifecycle of their programs.



How KPMG can help

As a trusted regulatory advisor, **KPMG LLP (KPMG)** understands which technologies, including RegTech solutions, enable the achievement of business performance and compliance to deliver these insights to our clients.

KPMG's Risk Consulting practice has a significant global footprint with over 23,000 professionals located in 93 countries. Our professionals help organizations transform risk into a competitive advantage while navigating

We provide practical ideas and informed risk perspectives, tailored to each client's circumstances, to help develop transformational strategies, including RegTech solutions, as well as the capabilities required to deliver sustainable change that drives business performance.

Across the globe, our dedicated **IT Advisory group** has over 10,760 professionals, of which 4,275 are deeply specialized within risk consulting. KPMG's IT Advisory services assists our clients with navigating new emerging technologies, developing processes to protect information assets, addressing assurance over third-party systems, and aligning their IT audit capabilities and governance with their firms' business strategy and complex regulatory requirements. We provide forward-thinking, resilient, and sound advice on timely and complex technology issues to help guide our clients toward the most effective RegTech solutions.

In addition to our regulatory knowledge, we have developed unique capabilities to assist in our clients' RegTech journeys. KPMG's credentials rest with our ability to execute and deliver our regulatory knowledge into actual solutions, including third-party or customized technology.

The **KPMG Innovation/Technology Lab** focuses on mining, sensing, and understanding the signals of change through a people-first lens. Our professionals assist clients with exploring these signals and translating them into business model strategy and operating model enablement aimed at revenue optimization, cost reduction, and risk mitigation.



We have subject matter professionals from multiple disciplines that provide an integrated approach across our global network of firms and focus on creating a suite of technology tools to help clients transform their business models through automation and integration. Specialists from various areas, including risk, compliance, forensics, IT, data and analytics, and strategy, design solutions to address regulatory issues. Working shoulder-to-shoulder with our clients, we use our RegTech research and insights to solve our clients' most complex business problems.

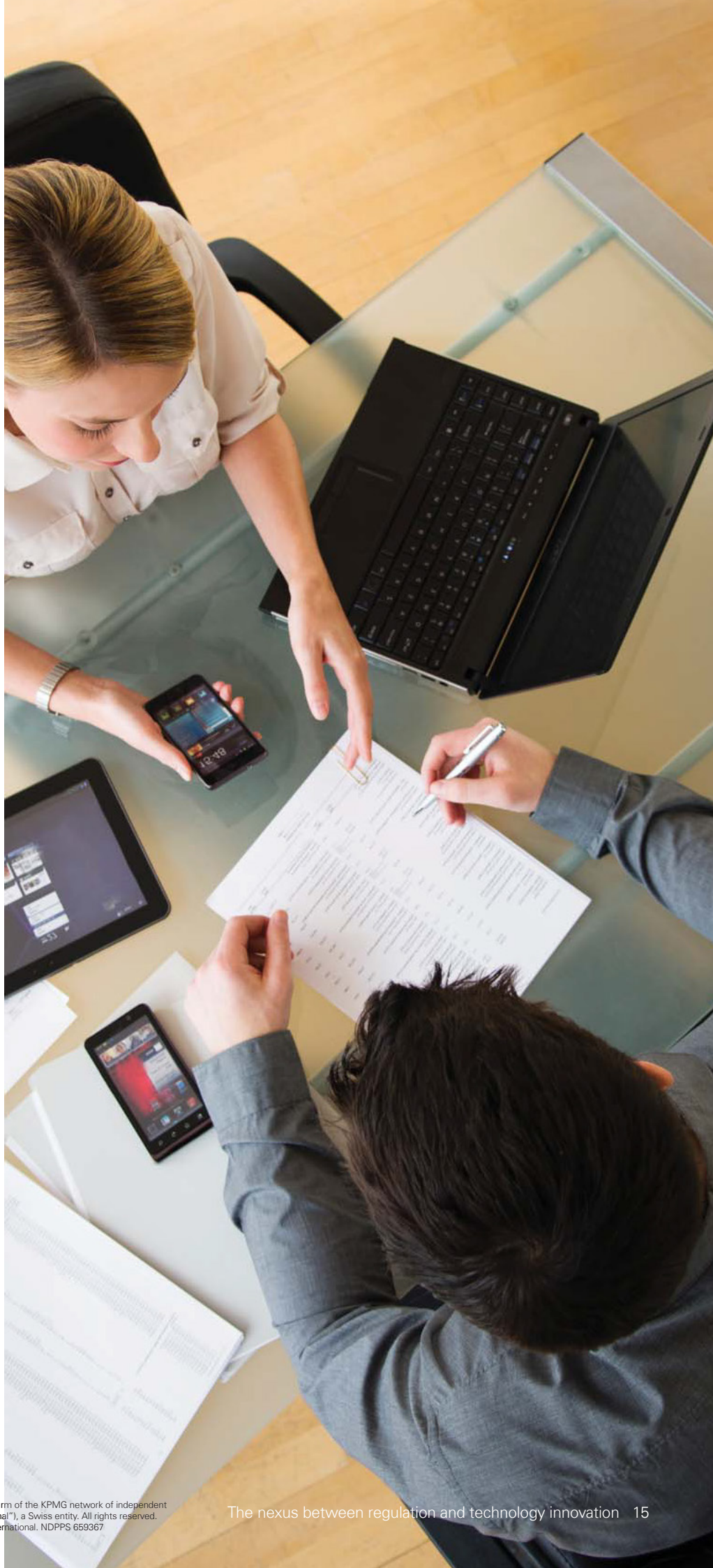
their most complex business issues. We offer deep knowledge and insightful opinions to help firms manage risk and create value in a dynamic environment in which outcomes must be managed strategically and with agility. We bring a forward-thinking, global mindset to help align corporate strategy and culture, protect financial assets from reputational damage, and work collaboratively to improve our clients' decision-making and operational effectiveness.

The **KPMG Strategic Alliance Program** allows us to combine forces with many of the world's leading service and technology providers. Being solution agnostic enables KPMG to deliver comprehensive solutions that help our clients address their toughest business challenges. Our strategic alliances complement and extend our deep business and technology experience.

KPMG's Executive Share Forums are another platform where we foster the dialogue between decision makers around key industry topics, with the education and application of RegTech being a key focus in 2017 and beyond.

KPMG's Global FinTech practice uses our worldwide network of regulatory knowledge and our teaming with the global FinTech startup community to help our clients identify the technology partner, equity investment, or full acquisition opportunity that will be specifically focused on our clients RegTech needs and opportunities. KPMG is the exclusive advisory alliance partner with Matchi.biz, the innovative FinTech matchmaking platform that connects banks and insurance companies with financial services technology start-ups and innovations sourced from across the globe.

Whether you seek advice for targeted change solutions or end-to-end support for an enterprise-wide transformation, KPMG is prepared to marshal all of our strengths – knowledge, experience, relationships, technology, and commitment – to work in an integrated fashion across our global network to assist you with executing the appropriate solution for your firm.



KPMG's client success stories

Our RegTech solutions assist financial institutions with streamlining their processes and controls around complex regulatory obligations, reigning in compliance cost, and protecting their brand from reputational damage. Prominent client experiences include stress testing and capital planning (e.g., CCAR/DFAST), regulatory reporting automation, and compliance transformation.

KPMG Regulatory Ecosystem

Client	A Top 10 U.S.-headquartered bank with multinational operations.
Challenge	<ul style="list-style-type: none">— Harnessing automation to sustainably enhance their compliance and regulatory change program through the inventorying, mapping, and reporting of core business data (processes, regulatory requirements, risks, controls, policies, procedures, test scripts, and attributes) at the point of execution level of detail.— Establishing a business process mapping standard, including an infrastructure for creating and maintaining business process maps inclusive of core business data overlays.
Enabling Technology	Our subject matter professionals used innovative capabilities from KPMG's Regulatory Ecosystem technology to curate a central repository of business processes, tied to regulations, risks, controls, policies, and procedures. These capabilities also support clients in their regulatory obligation mapping, risk and control assessments through a standardized testing methodology and process, and regulatory change management. In addition, these solutions enable the execution of a robust monitoring and testing function.
Results	<ul style="list-style-type: none">— Deployment of leading project management methodologies alongside an automated regulatory ecosystem that enabled the client to address regulatory actions in a thoughtful and efficient manner.— Core capabilities provided to inventory, sustain, map, and report on core business data.— Testing and monitoring results can now be linked directly to the various core business process maps and automated updates populate the process maps with the most current core business data.— Identification of a business process mapping standard that can be applied in a sustainable manner as changes occur.

Regulatory Reporting Automation

Client	A Top 10 U.S.-headquartered bank with multinational operations.																							
Challenge	FRY-9C and Call Report reconciliation and aggregation across multiple legal entities.																							
Enabling Technology	Our subject matter professionals and KPMG’s Financial Institutions Reporting Engine, an automated reporting platform with related services that helps financial institutions increase efficiency, simplify reporting, and improve their compliance programs. The Financial Institutions Reporting Engine applies ontology tool capabilities to support the production of regulatory reports, automate schedule line item reconciliations and controls, assess and distribute new regulatory rules, assign and store key attributes to schedules and schedule line items, and perform Federal Reserve-required XML edit checks.																							
Results	<div><div><div>Bank’s reconciliation business process</div><div><table><thead><tr><th>Process</th><th>Pre Automation</th><th>Post Automation</th></tr></thead><tbody><tr><td>Data ingestion of reports for reconciliation (handling the pre-reconciliation manual adjustments)</td><td>150</td><td>Early detection of inconsistencies in regulatory, external, and management reporting</td></tr><tr><td>Managing reconciliation rules & thresholds</td><td>650</td><td>Adjustable threshold for variance analysis reduces time to identify significant deltas</td></tr><tr><td>Generate reconciliation reports & validation</td><td>150</td><td>Greater visibility and traceability into overlays and adjustments at a granular level</td></tr><tr><td>Apply management adjustments/overlays & iterate reconciliation</td><td>200</td><td>Strategic placement of management overlay capabilities across all reports</td></tr><tr><td>Generate custom dashboards to analyze reconciliation output</td><td></td><td>New capability delivered</td></tr><tr><td>Total</td><td>1,150 Hours</td><td>150 to 500 Hours 55% to 85% Reduction in Effort</td></tr></tbody></table></div><div>Individual results may vary depending upon existing firm processes.</div></div></div>			Process	Pre Automation	Post Automation	Data ingestion of reports for reconciliation (handling the pre-reconciliation manual adjustments)	150	Early detection of inconsistencies in regulatory, external, and management reporting	Managing reconciliation rules & thresholds	650	Adjustable threshold for variance analysis reduces time to identify significant deltas	Generate reconciliation reports & validation	150	Greater visibility and traceability into overlays and adjustments at a granular level	Apply management adjustments/overlays & iterate reconciliation	200	Strategic placement of management overlay capabilities across all reports	Generate custom dashboards to analyze reconciliation output		New capability delivered	Total	1,150 Hours	150 to 500 Hours 55% to 85% Reduction in Effort
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