The role of RegTech in digital age: Risks and Opportunities

Alikhayyam Guluzade
Information Risk Manager/ KPMG CIS

November 2019
Table of Content

1. Introduction to RegTech
2. Global market demand and potential
3. Trends and developments
4. Market challenges
5. Key RegTech solutions
6. Competitive landscape
7. Client case studies
# Table of Content

1. Introduction to RegTech
   — Characteristics and Benefits
   — RegTech Ecosystem
   — Role of RegTech in Financial Institutions
   — Growth Drivers of RegTech market
Global RegTech industry — Introduction to RegTech

- RegTech is primarily the use of technology to address regulatory and compliance requirements. This includes adoption of new technologies such as advanced analytics, Robotic Process Automation (RPA), cognitive computing, and cloud solutions to help address regulatory compliance and risk management needs.
- These technologies aim to improve efficiency in compliance processes by reducing costs, and providing insights into emerging risk issues.

Characteristics of RegTech

- Agility
- Speed
- Integration
- Analytics

Benefits of RegTech

- Cost - Cut
- Sustainable and scalable solutions
- Risks and Issues management optimization
- Controls and risk frameworks linkage

Complex and cluttered data sets can be de-coupled and organized through ETL (Extract, Transfer Load) technologies.

Reports can be configured and generated faster with help of RegTech.

RegTech uses analytic tools to intelligently mine existing ‘big data’ data sets.

Offers shorter time frames for efficient working of solutions.

Global RegTech industry — RegTech Ecosystem

RegTech ecosystem includes collaboration between the following players to overcome the barriers including forming a common solution, establishing a set of standards and understanding complex regulations:

01 Regulators
Regulators will firstly open the dialogue and gather market views for promoting innovation and creating common integrated standards.

02 RegTech firms
Next, RegTech firms develop solutions to meet the growing requirements of businesses and regulators.

03 Professional services
Professional services firms are responsible for driving cohesion of regulatory standards, institution needs and vendor solutions as well as connecting providers and users.

04 Financial institutions
Lastly, FIs adopt and develop the solutions developed by the regulatory technology firms.

Source: “Everything you need to know about RegTech- The new Fintech”, Due.com website, Link; accessed on 9 November 2017
Global RegTech industry — Role of RegTech in FIs (1/2)

“By 2020 RegTech is expected to make up 34% of all regulatory spending.”

- $1.37bn: RegTech investment in the first half of 2018 - more than for all of 2017
- $270bn: Financial institutions’ annual compliance spending
- $76bn: Forecast RegTech spending by 2022 - up from $10.6bn in 2017
- >$300bn: Fines paid by banks since 2008
- 23,864: Fintech patents owned by the most prolific tech company
- 7,000: Number of compliance staff employed by a global bank in 2014 - four times more than before the financial crisis
- 10-15%: of financial institutions’ staff work on governance, risk management and compliance
- 34%: RegTech’s predicted share of all regulatory spending by 2022 (4.8% in 2017)
- 4,697: Total fintech patents owned by the top 15 banks

---

1 FT, Banks’ AI plans threaten thousand of jobs, 2017
2 KPMG, The Pulse of Fintech, July 2018
3 FT, Banks face pushback over surging compliance and regulatory costs, 2015
4 Bloomberg, World’s biggest banks fined £321bn since financial crisis, 2017
5 Juniper, Research Strategies for Financial Services 2017-2022, October 2017
6 FT, Banks’ AI plans threaten thousand of jobs, 2017
7 Aistemos, Technology Disruption Through a Patent Lens, July 2018
8 Aistemos, Technology Disruption Through a Patent Lens, July 2018
9 KPMG, The Pulse of Fintech, July 2018
Global RegTech industry — Role of RegTech in FIs (1/2)

RegTech companies provide new approaches and solutions to FIs for solving compliance–related challenges in their business functions

Regulatory compliance challenges faced by FIs

- Increased complexity
- Legacy system constraints
- Stringent timelines
- Incumbent compliance solution constraints
- High costs

Core FI business functions where RegTech’s can help

- Cloud–based managed compliance services
- Liquidity risk management
- Compliance monitoring and validation services
- Anti–Money Laundering and Countering Financing of Terrorism (AML/CFT)
- Integrated risk and compliance management and reporting
- Payments compliance
- Trade surveillance
- Asset Management
- International tax regulations enforcement
- Fraud management
- KYC/CDD
- Trading
- Information security assurance

Source: “Risk Analytics: Know the worth of data driven risk intelligence”
Global RegTech industry – Role of RegTech in FIs (2/2)

RegTech companies provide new solutions and approaches across various business areas with services related to compliance, identity management and control, risk management, regulatory reporting, transaction monitoring and trading.

Key business concerns served by RegTech firms

- **Regulatory compliance**
  - Examples include enterprise-wide solutions for identifying and keeping track of changes in regulatory requirements.
  - Such technologies reduce the costs of manual compliance procedures.

- **Client onboarding process**
  - Focuses on counterpart due diligence and KYC procedures, anti-money laundering (AML) controls and fraud detection.
  - For instance, digitalization of client or partner onboarding processes.

- **Risk management**
  - Focuses on tools to improve the risk management process at financial institutions.
  - This occurs by bringing efficiencies to the generation of risk data, risk data aggregation, internal risk reporting, automatically identifying and monitoring risks.

- **Regulatory Reporting**
  - A crucial area for supervisory agencies and a central element in regulatory compliance.
  - RegTech solutions help automate and integrate regulatory reporting requirements to cut costs, and streamline and increase the accuracy and timeliness of reporting, including making real-time reporting possible.

- **Monitoring/Surveillance**
  - Transaction monitoring focuses on conduct-of-business requirements, and solutions offer real-time transaction monitoring and auditing, end-to-end integrity validation, anti-fraud and market abuse identification systems, back-office automation.
  - Trading relates to the automation of the numerous procedures related to transacting in financial markets.

Source: FinTech, RegTech and SupTech: What They Mean for Financial Supervision, Toronto Centre.
Global RegTech industry — Key growth drivers

Factors contributing in surging the need of RegTech includes stringent financial regulation after 2008 financial crash, increased demand on data reporting, evolution of new technologies, challenges related to handling data and creation of risk with new sources of data.

Factors driving growth of Global RegTech market

Stringent financial regulations after global economic slowdown

The financial crisis of 2008 resulted in revised regulations including heavy fines for non-compliance, resulting in need of improved technology.

Challenges related to capturing, storing and analyzing data in–house

FIs face serious challenges to deal with huge amount of data in-house, resulting in need of RegTech.

New sources of data creates new opportunities to deal with risk

Production and management of large amount of data from new sources creates the need for RegTech for handling risks.

Surging demand of data reporting

Revised regulations resulted in increasing demand for data reporting by the FIs, thereby generating need for RegTech.

Evolution of technologies such as cloud and big data analysis

Technology has been a major enabler for RegTech including advancements in AI, biometrics, Big data and cloud services.

Source: “Emergence of RegTech: What you need to know”, Bobs Guide Website
Table of Content

2. Global market demand and potential
Global RegTech industry — RegTech evolution

RegTech solutions are looking forward to move from Know Your Customer (KYC) to Know Your Data (KYD) approach

Evolution of RegTech

RegTech 1.0
1987–2008
- Analysing exchange-based activities
- Quantitative risk management / Basel II¹

RegTech 2.0
2008 – Present
- Facilitate compliance
- Improve supervision and regulation

RegTech 3.0
Look Forward
- RegTech to re-conceptualize finance and financial regulation
- From KYC to KYD

Know Your Customer (KYC)
- Consumer Protection
- Prudential Regulation
- Financial Stability
- Prevent Bad Behaviors
- Re-Active
- Licenses are barriers
- Reporting (Push) Compliance

Know Your Data (KYD)
- Data Privacy
- Algorithm Sandbox
- Financial Networks
- Promote good behaviors
- Pro – Active
- Deep Learning is barrier
- API (Pull) Compliance

According to analysts, “The financial system is on the edge of moving from being based on Know-Your-Customer (KYC) principles to a Know-Your-Data (KYD) approach”

Note(s): 1) Basel II is a set of international banking regulations put forth by the Basel Committee on Bank Supervision, which leveled the international regulation field with uniform rules and guidelines; 2) 1 € = US$0.84778
Global RegTech industry — Market demand and potential

Global demand for RegTech solutions is expected to increase at a CAGR of 18.9 percent during 2015–20. The industry showcases immense potential in the coming years, with emergence of new technologies such as RPA, IA and Big Data analytics.

The global demand for RegTech solutions is expected to surge at a CAGR of 18.9 percent over 2020, reaching €100.6 billion.

The global RegTech spending by FIs is estimated to increase from €9 billion to €64.7 billion at a CAGR of 48.4 percent over 2022.

### Global demand for RegTech solutions by geography, 2019

- **Asia-Pacific**: 35%
- **Rest of the world**: 65%

**Total= €42.4 billion**

### Global demand for RegTech solutions by segment, 2020F

- **Consulting and Business services**: 55%
- **Others**: 45%

**Total= €100.6 billion**

### Regulatory fines imposed in 2008 - 2019

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Date</th>
<th>Amount (€ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of America</td>
<td>US</td>
<td>2014</td>
<td>14.14</td>
</tr>
<tr>
<td>JPMorgan Chase</td>
<td>US</td>
<td>2013</td>
<td>11.02</td>
</tr>
<tr>
<td>Bank of America</td>
<td>US</td>
<td>2012</td>
<td>10.00</td>
</tr>
<tr>
<td>BNP Paribas</td>
<td>France</td>
<td>2015</td>
<td>7.54</td>
</tr>
<tr>
<td>Bank of America</td>
<td>US</td>
<td>2011</td>
<td>7.20</td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td>Germany</td>
<td>2016</td>
<td>6.10</td>
</tr>
</tbody>
</table>

Note(s):  
*US$ = € 0.84778; in the segmentation graph, ‘others’ and ‘rest of the world’ were not defined in the source; F-Forecast  
Source: Juniper Research: RegTech spending to exceed $76 billion by 2022, as compliance costs soar; International RegTech Companies Defining the $100-Billion Industry, Let’s talk payments.
Global RegTech industry — Industry experts’ views on the market

Industry experts highlight the potential of RegTech companies and are positive about the growing adoption of RegTech solutions by majority of the FIs in the near term.

“With RegTech helping unlock and facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities, it’s easy to understand why RegTech is now firmly on the agenda. However, for compliance and IT teams, finding, understanding and validating proven RegTech solutions can be difficult.”
— Tina Snelling, CEO Market Fintech and Editor of the RegTech Performance Report

“There has been technology used at various levels in the Regulatory space for over 20 years. However, what the new RegTech label recognizes is that the gap between software and non-software enabled services has widened significantly”
— Alan Meaney, CEO of FundRecs

“Harnessing the capabilities enabled by new technologies such as cloud computing, big data, and blockchain, are devising solutions to help companies across all sectors of activity ensure that they comply with regulatory requirements. In the financial sector, RegTech is deemed a subarea of what is generically known as Fintech.”
— Javier Sebastián, BBVA Research’s expert in digital regulation

“The question for market participants is how they can turn a regulatory constraint into an advantage. Technology can be deployed to create more value for asset service providers and their clients, bringing more possibilities to exploit data in an intelligent way.”
— Mathieu Maurier, Global Head of Sales & Relationship Management for SGSS

“I would define it as technological advancement that assists those focused on compliance and regulatory-related activities in their professions. So making it easier, swifter, more complete, more efficient to monitor compliance and regulatory obligations.”
— Kari Larsen, counsel at Reed Smith LLP in New York

Source: “BearingPoint ranks as a top performer in the first RegTech Supplier Performance Report by Market Fintech”, Bearing Point website. Link: “Everything you need to know about RegTech - The new Fintech”, Due.com website. Link:
### Table of Content

3. Key trends and developments shaping up the future of RegTech market
   - Emerging new technologies
   - Rising M&A activities
   - Increasing number of startups
   - Support from government and regulators
Global RegTech industry — Trends and developments shaping up the future (1/3)

Emerging technologies such as RPA and IA are enabling the creation of new RegTech solutions for FIs for the compliance management.

RPA is enabling the creation of differentiated RegTech solutions to help address challenges related to compliance, regulatory, and risk management needs:

- RPA is an emerging form of process automation technology based on the concept of software robots.
- With the help of this technology, FIs are leveraging rule-based systems to automate repeatable, logic-based business processes, such as checking internal compliance controls.
- It is also useful in automating manual tasks such as form processing, accounts payable, and staff onboarding, where data needs to be transferred from one software system to another.
- RegTech, powered by RPA, can be used to collect, analyze, and test entire new data sets, identifying potential risks, as well as generating more meaningful Management Information (MI).
  - For example, a robust fraud detection platform developed using RPA technology could shorten the transaction life-span and improve consumer experience as well as commercial profitability by reducing the number of false negatives.

Emergence of Intelligent Automation has promoted the use of cognitive technologies to build self-learning systems for automating intuitive tasks, such as compliance investigations processing, data extraction and quality control:

- The decreasing costs of data storage and processing power are enabling new cognitive technologies with humanlike capabilities, such as recognizing handwriting, identifying images, and natural language processing.
- Upon combining with RPA, these cognitive technologies form IA solutions that can either directly assist people in the performance of non-routine tasks or even automate those tasks entirely.
- Industry analysts believe that the use of new innovative technology, such as RPA and IA, can transform FIs by increasing their profitability and efficiency, while at the same time making compliance less complex and capacity demanding.

Source: Two Important RegTech Trends That Will Shape The Future. Link
Global RegTech industry — Trends and developments shaping up the future (2/3)

The industry growth is also being driven by rising number of M&A activities in RegTech space, spurring the overall profitability of the sector.

Rising M&A RegTech activities

Total number of RegTech M&A exits globally, 2013–18

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>exits</td>
<td>8</td>
<td>12</td>
<td>23</td>
<td>28</td>
<td>29</td>
</tr>
</tbody>
</table>


RegTech deals by geography, since 2014 till September 2018

- The US 74%
- Rest of the world 8%
- The UK 10%
- Canada 3%
- India 5%
- Israel 2%
- Rest of the world 8%

- According to a report by CB Insights, in 2016 there were 30 RegTech exits, including 29 M&A transactions and 1 IPO
- Since 2013, US–based RegTech companies have accounted for approximately 74 percent of total deals in global RegTech sector
- The UK stood second with 10 percent share, followed by Canada and India with 3 percent each, and Israel with 2 percent
- In terms of region, Europe alone has accounted for approximately 18 percent of total global deal share

Note(s):  *1US$ = €0.84778; data is till March 2019
Global RegTech industry – Trends and developments shaping up the future (3/3)

Growing number of RegTech startups along with increasing contribution of governments and regulators for the development and adoption of RegTech solutions is expected to lead to further growth in the industry

RegTech startups are increasingly focused on helping financial institutions in dealing with surging regulatory requirements after the 2008 financial crash

- Since 2013, private RegTech companies have raised approximately €4.2 billion in disclosed equity funding across 585 deals globally
- While the US leads in RegTech deals and funding, countries in Europe collectively account for 18 percent share in RegTech deals globally
  - Since 2012, more than €211.9 million has been invested in Canadian RegTech companies such as Agreement Express, Trulioo and VigilantCS, which are establishing themselves in the global RegTech market by providing technology solutions for financial institutions
- Europe has been a center of early-stage RegTech startups focusing on solutions for the financial services industry
- By helping companies traverse through the regulatory requirement, the startups are gaining support from some regional regulators such as the UK’s Financial Conduct Authority (FCA)

Government and regulators are providing support for the development and adoption of new RegTech solutions, thereby helping the FIs to cope with the revised regulations

- In November 2015, the UK Financial Conduct Authority (FCA) launched a dedicated workgroup to focus on RegTech
  - FCA sought views on how it could support the development and adoption of new RegTech solutions
- Furthermore, in 2016, the UK government budget allocated funds to support the adoption of new technologies to deliver regulatory requirements.
- The Singapore government is focused on promoting a smart nation and the Monetary Authority of Singapore is concentrating on shifting towards an API-driven architecture for RegTech
- In the coming years, RegTech will continue to gather support from governments around the world

Note(s): *1US$ = € 0.84778
4. Key market challenges
   - Changing regulatory landscape
   - Short existence of new RegTech solutions
   - Lack of platforms for collaboration
   - Knowledge sharing barriers between regulators and FIs
Global RegTech industry — Key challenges (1/3)

RegTech companies face various issues and challenges related to changing regulatory landscape, short existence of RegTech solutions, lack of platforms for collaboration and knowledge sharing barriers between regulators and FIs.

Overview

- With products based on new and recent technology, RegTech is still a nascent market, with many ventures existing for only a couple of years or less.
- The emergence of RegTech is expected to benefit both the established institutions and the disruptive FinTech companies in financial sector.
- However, there are various factors, rules and policies certainly which act as barriers to the development, adoption and implementation of RegTech for financial services.

Challenges faced by FIs in adoption of RegTech solutions:

01 Changing regulatory landscape

02 Short existence of new RegTech solutions

03 Lack of platforms for collaboration

04 Knowledge sharing barriers between regulators and FIs
Changing regulatory landscape leads to uncertainty on the new reporting requirements, thereby making it challenging for FIs to choose an appropriate compliance solution

- Intensification of financial regulation post-2008 financial economic crisis has resulted in revision of regulations globally
  - The regulatory landscape in financial sector is further complicated by the introduction of overlapping and expanding variety of products and services being offered
  - Recent political events such as Brexit and Trump’s presidency are creating new uncertainties in the regulatory landscape, thereby hampering the growth of the RegTech industry
- FIs have a disadvantage to invest in a software solution for a particular compliance, as the regulatory requirement for it could change in near future
- Moreover, the acquisition and implementation of RegTech solution in current infrastructure is costly, thereby making it important for the institutions to be cautious before making the long term investment

The short existence of upcoming RegTech solutions suggests that FIs are still unfamiliar with its possibilities, reliability and acceptance, creating challenge in RegTech procurement

- Changing to market–supplied software from in–house built applications would require a major cultural shift within the institution
- Eventually, FIs are expected to benefit from a coordinated industry–wide design and collaboration effort to set clear standards in the product development phase, including all relevant regulators providing clear guidelines on the product requirements
  - The move would provide an opportunity for RegTech firms to compete in the market by offering compliant products to banks, thereby meeting the needs of their changing business models
  - However, the current product development life cycle is based on adoption of emerging solutions which would require time to be successful in the market

Source: ‘RegTech in Financial services: Technology solutions for compliance and reporting’, Institute of International Finance. Link:

© 2019 “KPMG Azerbaijan Limited”, a company incorporated under the Laws of the Guernsey, acting through its Representative Office in the Republic of Azerbaijan, a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

Document Classification: KPMG Confidential
Global RegTech industry — Key challenges (2/3)

Furthermore, factors such as lack of common platforms and networks for collaboration, and knowledge sharing barriers between regulators and FIs too act as challenges for the growth of RegTech industry

RegTech industry lacks common networks and platforms for bringing together regulatory experts, software developers and FIs, which is necessary for its development

- Development of RegTech solutions requires collaboration between from two separated groups — technology developers and regulatory experts
  - The combined knowledge base of issue-focused industry associations and product-focused technology firms should be leveraged in order to solve the most critical challenges of the industry
- A coordinated effort for bringing together stakeholders such as regulatory experts and regulators, technology and software developers, FIs and entrepreneurs willing to invest and start new businesses is required in the industry
- The act would enable FIs to better understand the products offered by different emerging RegTech competitors, and for interested participants from all disciplines to get to know each other and understand their different perspectives.
- Additionally, in order to promote competition in the financial services industry, platforms could also focus on open-source RegTech approaches

Discussing the roadblocks in compliance with regulators can be legally difficult for FIs. This could be an obstacle in effective knowledge sharing between FIs, regulators and RegTech firms

- Industry experts believe that effective knowledge sharing is essential for the development of RegTech players in the industry
- Building RegTech solutions requires extensive knowledge of the regulatory architecture
- Regulators are expected to take an active role in the process by setting up a regulatory/supervisory knowledge hub to share knowledge on regulation, supervisory practice, data formats and requirements with RegTech developers
- Furthermore, regulators could provide a safe environment where RegTech firms share the information about compliance challenges and difficulties
  - They could provide a platform keeping in mind the RegTech firms’ relationship with compliance and enforcement authorities and their status as competitors

Table of Content

5. Key RegTech solutions in the market
Global RegTech industry — Key solutions in the market (1/2)

RegTech solutions solve the intricate issues prevailing in the financial sector such as risk data aggregation and management, scenario analysis and forecasting, identity verification, real-time payments monitoring, reporting and blocking

| Risk data aggregation and management | • Cryptography, cell-level security, data ingestion, information sharing technology and blockchain are used for improving data management and security  
| | • Open platforms and networks helps to build a robust standard data dictionary across the industry  
| | • Machine learning and advanced analytics with the potential use of quantum computing is used for organizing large volumes of structured and unstructured data |
| Modeling, scenario analysis and forecasting | • Machine learning and advanced analytics help in refining the modeling and data analysis process of FIs  
| | • Modern data visualization techniques are used for improving interpretation of data and advanced data analytics |
| Real-time payments monitoring, reporting and blocking | • Blockchain has a potential to substitute existing, tiered payments systems  
| | • Machine learning helps in interpreting unstructured data/metadata outputs of payments systems, such as the identification of payments beneficiaries |
| Identity verification | • Blockchain technology is already used as a mechanism for digital identity verification and would develop into a secure information sharing system in the future  
| | • Data mining, natural language processing and visual analytics is used for processing and analyzing of unstructured data for providing an operational solution to solve for client onboarding  
| | • Biometric and social verification are used especially in emerging market |

Source: "RegTech in Financial services: Technology solutions for compliance and reporting", Institute of International Finance. [Link](#)
Global RegTech industry – Key solutions in the market (2/2)

RegTech companies leverage emerging technologies such as blockchain, machine learning, big data analytics and cloud–computing for providing appropriate solutions in the market.

| Monitoring behavior and organizational culture | • Unstructured data analytics combined with voice–to–text capabilities is used to improve communications surveillance, recognize behavioral patterns from data, for example, to make rapid consumer suitability determinations |
| Real-time trading tasks (financial markets trading) | • Machine learning and predictive analytics are helpful for markets trade surveillance including real–time margins calculating, CCP choice and risk management engines, compliance monitoring, end–of–day reconciliation of all transactions and reporting for derivatives trading • Blockchain is used as a substitute for current trading platforms |
| Making financials more aware of regulatory developments | • Cognitive computing / deep learning techniques are used for enabling regulatory radar software with understanding of regulations |

6. Competitive landscape
   — RegTech startup firms
Global RegTech industry — Geographic spread of key RegTech solution providers

RegTech companies providing compliance solutions to FIs are spread across the globe, however, majority of them are concentrated in the European region followed by North America.

Source: 'International RegTech Companies Defining the $100-Billion-Dollar Industry', Let's Talk Payments website
7. Client case studies
   - InvestorCom
   - Bearing Point
   - ClusterSeven
   - Behavox
   - IBM Watson
### Client case studies (1/5)

RegTech solutions company, InvestorCOM, helped Canadian Securities Administrators (client), with the deployment of its RegTech solutions for timely meeting the POS3 regulatory deadline and reducing the overall compliance cost for the client.

<table>
<thead>
<tr>
<th>About the client</th>
<th>Challenges faced by the service provider</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In May 2016, Canadian Securities Administrators (CSA) was in the process of implementing the last stage of Point of Sale (POS) regulation</td>
<td>• The POS regulation required delivery of a specific Fund Facts document for every mutual fund, per series and by language. This resulted in generation of more than 35,000 legal documents to be chosen from&lt;br&gt;• The POS regulation represented another new regulation affecting the wealth management industry, adding to the rising compliance costs in the industry&lt;br&gt;• Many mutual fund dealer firms lacked the internal IT resources or systems to address the POS regulation due to their competing priorities</td>
<td>• InvestorCOM implemented its solution ahead of the deadline for some of Canada’s leading dealers including tier 1 banks, large and small Investment Industry Regulatory Organization of Canada (IIROC) and Mutual Fund Dealers Association (MFDA) dealers</td>
</tr>
<tr>
<td>• CSA wanted to implement new disclosure regulation to improve transparency in the investment funds industry</td>
<td></td>
<td>• This led to InvestorCOM gaining a 20 percent market share through the deployment of its RegTech solutions</td>
</tr>
<tr>
<td>Problem faced by the client</td>
<td>RegTech solutions provided by InvestorCOM</td>
<td>• Following the CSA services, InvestorCOM deployed its RegTech solutions for a tier 1 bank with €555.2 billion (US$655 billion) in assets, serving approximately 20 million customers&lt;br&gt;• This bank dealer was the only one of Canada’s five big banks to meet the May 30 compliance deadline, through InvestorCOM’s solutions&lt;br&gt;• InvestorCOM was successful in meeting the needs of its lines of business and launching the InvestorPOS™ solution timely and on budget</td>
</tr>
<tr>
<td>• CSA wanted to develop an innovative solution for the mutual fund industry to address the new Point Of Sale regulation, POS 3, addressing the pre-sale delivery of a new disclosure document called “Fund Facts”</td>
<td>• InvestorCOM developed two solutions, for both asset managers and dealers:&lt;br&gt;— Publisher™ - an online automated composition platform for regulatory and marketing documents including the Fund Facts, Management Reports of Fund Performance (MRFPs) and Financial Statements&lt;br&gt;— It facilitated collaboration amongst asset manager teams and reduced compliance costs by incorporating fund-specific data into client-defined templates&lt;br&gt;— InvestorPOS™ - a repository and workflow solution for dealers and advisors to deliver Fund Facts and other disclosure documents to investors in compliance with the POS regulation</td>
<td></td>
</tr>
</tbody>
</table>

Source: "InvestorCOM becomes a leading RegTech company with the successful launch of its Point of Sale solutions in the wealth management industry", InvestorCOM.com.
Client case studies (2/5)

RegTech company, BearingPoint, helped Santander Consumer Bank (client), with the deployment of its RegTech solution, ABACUS for seamless of the MMSR regulatory obligation by the European Central Bank

<table>
<thead>
<tr>
<th>About the client</th>
<th>RegTech solutions provided by BearingPoint</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Santander Consumer Bank (SCB) operates in Germany. It is a core subsidiary of Banco Santander, one of the largest financial groups in the world</td>
<td>• SCB leveraged BearingPoint’s ABACUS/Transactions regulatory software solutions for successful transition to the MMSR regulation</td>
<td>• With this collaboration between SCB and BearingPoint, SCB was able to successfully and legally comply with the MMSR regulation</td>
</tr>
<tr>
<td>• Its central software unit, Ingeniería de Software Bancario (Isban), is part of the Technology and Operations division of SCB</td>
<td>• The SCB regulatory team engaged with Isban’s multidisciplinary teams to define their business requirements and translate them in IT terms</td>
<td>• The ABACUS framework set up, continuously scans the regulatory environment and takes into account any changes introduced. Thereby, seamlessly adopting the rules and remaining up-to-date</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem faced by the client</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• The European Central Bank’s (ECB) Money Market Statistical Reporting (MMSR) regulation was posing a problem for SCB with the high level of implementation complexity</td>
<td>• With the new regulations, timelines were short and more data had to be processed</td>
</tr>
<tr>
<td>• With the new regulations, timelines were short and more data had to be processed</td>
<td>• By removing the buffer period for verifying the data, SCB was facing risk management considerations</td>
</tr>
<tr>
<td>• By removing the buffer period for verifying the data, SCB was facing risk management considerations</td>
<td>• SCB followed a defined process chain: the teams worked in small sprints so they could test and develop, while simultaneously shrinking the waiting time of other teams</td>
</tr>
</tbody>
</table>

Source: “Santander deploys ABACUS/Transactions to comply with MMSR obligations”, BearingPoint.com
Client case studies (3/5)

RegTech solutions company, ClusterSeven, helped Rabobank (client), with the deployment of its RegTech solutions for deployment of its Inventory Management System (IMS) to ensure regulatory compliance and reduce compliance costs

<table>
<thead>
<tr>
<th>About the client</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rabobank is a Dutch multinational banking and financial services company headquartered in Utrecht, Netherlands</td>
</tr>
<tr>
<td>• It specializes in food and agriculture financing and sustainability-oriented banking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem faced by the client</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rabobank identified the extensiveness of their spreadsheet and End User Computing (EUC) landscape</td>
</tr>
<tr>
<td>• They needed to demonstrate control over the spreadsheets for recognition of the demands of regulators and eliminate any spreadsheet-related mishaps</td>
</tr>
<tr>
<td>• Rabobank sought help from ClusterSeven to ensure its regulatory compliance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges faced by the service provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rabobank had previously invested in ClusterSeven’s Enterprise Spreadsheet Manager (ESM), which applies a control framework to provide visibility of changes made to spreadsheets</td>
</tr>
<tr>
<td>— However, the solution was located in a different part of the organization and consequently was under-utilized</td>
</tr>
<tr>
<td>— Additionally, due to a lack of enforceable spreadsheet and EUC policy, securing user participation to adopt ESM posed a challenge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RegTech solutions provided by InvestorCOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rabobank deployed ClusterSeven’s Inventory Management System (IMS) and simultaneously devised a corporate policy to support the spreadsheet and EUC control and risk management exercise</td>
</tr>
<tr>
<td>• The integration between the IMS and ESM solutions automated the entire regulatory process – from registering an identified spreadsheet/EUC, to retirement and replacement in the enterprise system</td>
</tr>
<tr>
<td>• Through the application of business logic and workflow, the administrators are able to evaluate the files and automatically send alerts for sign-off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• This solution provided the bank with the capabilities it needed to create an up-to-date inventory of all the EUC files and spreadsheets</td>
</tr>
<tr>
<td>• With ClusterSeven’s RegTech solutions, Rabobank has gained complete visibility of its landscape of spreadsheets and EUCs</td>
</tr>
<tr>
<td>• Using IMS, the bank has created a template solution, which provides the ability to categorize the criticality of every spreadsheet into high, medium and low risk</td>
</tr>
<tr>
<td>• The IMS solution has provided Rabobank flexibility and enabled an approach to risk management by saving time and effort, in addition to providing a full historical record</td>
</tr>
<tr>
<td>• The services cover a wide scope of policies ranging from regulatory to internal policy as well as identification of other control issues such as operational incidents</td>
</tr>
<tr>
<td>— This ability reduced the administrative time utilized on the previous manual processes</td>
</tr>
</tbody>
</table>

Source: “Rabobank deploys ClusterSeven IMS”, IBSIntelligence.com
### Client case studies (4/5)

RegTech solutions company, Behavox, helped TO ICAP(client), with the deployment of its RegTech solutions for significantly reducing the number of false positives, thereby increasing the productivity of the company

#### About the client
- TP ICAP is a global firm of professional intermediaries that plays a significant role in the world’s financial, energy and commodities markets
- The company offers brokering services in fixed income securities and their derivatives, interest rate derivatives, treasury products, equities and energy

#### Problem faced by the client
- TP ICAP is a global interdealer broker which trades through voice and electronic means
- The company faced challenge with its keyword-based system which produced a large number of false positives, a test result which wrongly indicates that a particular condition or attribute is present
- So, a solution was required which could deal with massive data files, 24 communications channels and diverse data types

#### RegTech solutions provided by Behavox
- In order to overcome challenge of producing large number of false positive, the company installed an off-the-shelf solution from Behavox
- The solution used following technologies to go through structured and unstructured data:
  - Machine Learning (ML)
  - Natural Language Processing (NLP)
  - Advanced neural network technology
- By consolidating isolate data, the solution tracked conversations while they move from one medium or platform to another
- Solution was implemented over the span of three months and went into production for 5,500 users globally

#### Outcome
- Behavox implemented its solution which dealt with huge data files including three terabyte data which was generated from one million phone calls in London
- The solution also managed diverse data types of the company including web browser history, ID card swipes, gift and entertainment logs
- After the implementation a pilot testing was conducted with 1,000 users and the results showed significant reduction in the number of false positives
  - False positives were numbered in hundreds from initial number of 64,000 for keyword-based system, thereby increasing the overall productivity of the company

Client case studies (5/5)

Jefferies (client) partnered with IBM and its Watson financial services team for enhancing its service offerings by providing hedge fund clients with deeper, more accurate insights into risk across their portfolios at lower cost.

About the client

- Jefferies is a global financial institution that serves various mid-size and large hedge funds.
- The company offers a broad range of products and services spanning investment banking, equities, fixed income and wealth management to clients in the Americas, Europe, the Middle East and Asia.

Problem faced by the client

- Jefferies aims to enhance its offering by providing hedge fund clients with deeper, more accurate insights into risk across their portfolios at lower cost.
- The company required a system that would allow clients to query and check portfolio positions, performance and risk in real-time.

RegTech solutions provided by Behavox

- In order to source market data for risk reports, Jefferies switched to a managed data service from IBM that integrates with IBM® Algo Risk® Service on Cloud to offer daily risk metrics and stress tests.
- The solution used following technologies to go through structured and unstructured data:
  - Every evening after close of business, Jefferies sends IBM a preliminary snapshot of the day’s holdings, before compiling and transferring the full data.
  - It enables IBM in generating the risk report for the day, reducing the potential for delays.
  - Next, IBM Algo Risk Service on Cloud scrutinizes the data to produce comprehensive risk reports, detailing each client’s holdings along with risk metrics and stress tests.
  - Finally, IBM sends the data to Jefferies, which generates reports and sends them to its clients.
  - Jefferies also uses the data for its own risk-assessment processes.

Outcome

- Jefferies also partnered with IBM and its Watson Financial Services team to apply new technologies from the cloud for its global range of partners working across equities.
- Jefferies achieved following results by implementing solution provided by IBM:
  - By 90 percent reduction in reliance on previous data vendor generates major cost savings.
  - Company observed 20 percent reduction in the cycle times which in turn declined the risk of delays for critical projects.
  - Moreover, it enabled expansion of special margin rules to a broader range of clients at no extra cost.

“…”

— Ehab Sorial, Senior Vice President, Prime Brokerage Technology, Jefferies

Source: "IBM case studies: Jefferies", IBM website, Link: "Adapting to Wholesale Change in the Prime Brokerage Industry", IBM Website.
Thank You!

Key Contact:

Alikhayyam Guluzade
Information Risk Manager
Management Consulting, KPMG in Azerbaijan
Tel: +994 12 404 89 10
   +994 50 546 47 43
E: alikhayyamguluzade@kpmg.az