Survey of 12 financial authorities

- Mexico (CNBV)
- Brazil (BCB)
- Peru (SBS)
- Morocco (BKAM)
- BCEAO
- Nigeria (CBN)
- Ghana (BOG)
- Egypt (CBE)
- Kenya (CBK)
- Tanzania (BoT)
- Mozambique (BDM)
- Nigeria (CBN)
- Ghana (BOG)
- Egypt (CBE)
- Kenya (CBK)
- Tanzania (BoT)
- Mozambique (BDM)
- Philippines (BSP)
<table>
<thead>
<tr>
<th>Challenge</th>
<th>% of Financial Authorities Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delays in submission</td>
<td>92%</td>
</tr>
<tr>
<td>Incomplete data</td>
<td>67%</td>
</tr>
<tr>
<td>Low quality of data</td>
<td>58%</td>
</tr>
<tr>
<td>Wrong interpretation of requirements</td>
<td>42%</td>
</tr>
<tr>
<td>Data manipulation</td>
<td>17%</td>
</tr>
</tbody>
</table>
Data validation challenges

- Human error: 67%
- System error: 50%
- Definitional error: 25%

% of financial authorities responding
New technologies, new opportunities.
Use cases

**REGTECH FOR REGULATORS**

- Machine readable and searchable regulations and chatbots to process licensing applications
- Policy simulations in a computational environment to test policy interventions
- Data analytics to facilitate ongoing regulatory impact assessment

**SUPTECH FOR SUPERVISORS**

- Self-executable (“smart”) contracts to automate compliance auditing
- APIs to automatize regulatory reporting
- Geo-tag to inform policymaking and close coverage gaps
- Layering external data to extract deeper insights
- Mobile apps and chatbots to register complaints and gain consumer insights
- Mobile apps and remote data access for on-the-go supervision
PHILIPPINES
Chatbot Application and Complaints Management System

A Chatbot Application and Complaints Management System for the Bangko Sentral ng Pilipinas (BSP)
R²A Project Retrospective and Lessons Learned

DATABASE STORAGE
CLOUD COMPUTING
VISUALIZATION TOOLS
DATABASE STORAGE
CLOUD COMPUTING
VISUALIZATION TOOLS
NATURAL LANGUAGE PROCESSING
APIs
MACHINE LEARNING
ARTIFICIAL INTELLIGENCE
DATA ANALYTICS
(Excel-like syntax)
Central Bank

Complaint Resolution Database

Complaint case database

CaseManager™

Electronic Portal for Supervised Entities

Call center complaint management interface

Consumer specialist

Chatbot Application

API

SMS Gateway

Gateway

Voice Calls

Mail

Emails

Facebook Messenger

SMS

Future channels

Kiosks and Walk-ins
BSP has visibility over customers’ experience
BSP can verify providers compliance with consumer protection and resolution mechanisms guidance
The system could determine patterns and structuralizes complaints for machine learning opportunities

Available to all Filipinos
Estimated 1 to 2 weeks/month for complaints analysis saved
PHILIPPINES
API Prudential Reporting System

An API-based Prudential Reporting System for the Bangko Sentral ng Pilipinas (BSP)
R²A Project Retrospective and Lessons Learned

APIs
(XML/REST)

DATABASE STORAGE
(SQLSERVER)

DATA ANALYTICS
(Excel-like syntax)

MESSAGING QUEUE
(RabbitMQ)

VISUALIZATION TOOLS
Supervised Entities

Report submission

Pairing process

Central Bank

Pending validation

Application Processing Interface (API)

Validation output

Processing of submissions

Storing data and indicators

Data storage

Data for analysis

Interface for ad-hoc analysis, dynamic analytical dashboard, and integration with third-party tools
<table>
<thead>
<tr>
<th>BEFORE</th>
<th>PROTOTYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 reporting schemes</td>
<td>1 unified scheme</td>
</tr>
<tr>
<td>243 reporting templates</td>
<td>210 reporting templates</td>
</tr>
<tr>
<td>107,000 data points</td>
<td>50,000 data points</td>
</tr>
<tr>
<td>7,000 validation rules in layers</td>
<td>7,000 validation rules with single validation</td>
</tr>
<tr>
<td>Layered reporting packages</td>
<td>Single reporting package</td>
</tr>
<tr>
<td>Processing time &gt; 30 mins</td>
<td>Processing time = 10 sec</td>
</tr>
<tr>
<td>Multiple processing and analytical layers</td>
<td>Single processing and analytical layers</td>
</tr>
</tbody>
</table>

- From 29 to 1 reporting scheme
- From 107,000 to 50,000 data points
- From 30 min. to 10 sec. processing time
MEXICO
APIs/ML for AML supervision
<table>
<thead>
<tr>
<th>BEFORE</th>
<th>PROTOTYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying transactions to low taxation jurisdictions</td>
<td>= 1.5 working week = 0.01 seconds</td>
</tr>
<tr>
<td>Identifying transactions by minors, adults &gt;80 years old, and companies &lt;3 years of incorporation</td>
<td>= 1 working week = 3 minutes</td>
</tr>
<tr>
<td>Calculating lags between detection date and alert day</td>
<td>= 3 working weeks = 15 seconds</td>
</tr>
<tr>
<td>Identifying alerts that were not submitted to committee</td>
<td>= 4 working days = 0.03 seconds</td>
</tr>
<tr>
<td>Duration of each on site inspection</td>
<td>= 3-5 weeks = 3–5 days</td>
</tr>
<tr>
<td>On site inspections per year</td>
<td>= 14 = 30+</td>
</tr>
<tr>
<td>Alerts based on risk models</td>
<td>= 42 = 57</td>
</tr>
</tbody>
</table>

Number of suspicious transaction alerts:
- BEFORE: 45 alerts
- PROTOTYPE: 57 alerts (+)

Duration of each on site inspection:
- BEFORE: 3-5 weeks
- PROTOTYPE: 3–5 days
- Smarter visualization
- Increased security
NIGERIAN DATA STACK

**INPUTS**
- Geo-tagged transactions
- Compliance Data
- Access Point Locations + Surveys
- Satellite Imagery Structures + Pop

**ORG-LEVEL AGGREGATION**
- NIBSS
- CBN
- BMGF
- NASA + CIESEN

**CONNECTION TO & CONSOLIDATION IN DATA WAREHOUSE**

**ANALYSIS & VISUALIZATION**
- Atlas of Map Visualizations
- Filtering + high level metrics via interactive widgets
- Live views of tabular data based on map navigation
- Customizable maps, vis, UI for future product development

**OUTPUTS: DASHBOARDS, REPORTS, DATASETS, ETC**

**APIS + VALIDATION**

**ACCESS CONTROL**

**POSTgreSQL**
Data Stack dashboards
FINANCIAL AUTHORITIES

\(\frac{2}{3}\) report receiving incomplete or bad quality data from supervised entities (R²A survey)

More than half report human or system errors affecting data validation (R²A survey)

Limited internal capacity, availability of funds, and difficult procurement cycles to test innovative approaches

REGTECH VENDORS

Inadequate analytical and visualization tools

The demand is unclear and fragmented

Smaller vendors may have innovative and cheaper products, but struggle to break in

They battle with long procurement cycles
R²A is an accelerator for the deployment of solutions that augment regulatory and supervisory capabilities.

Our approach
R²A provides matched funding for development of solutions

Global perspective and peer learning

R²A helps to structure a project in a way a vendor can understand and respond

R²A has a vendor database and ability to follow a range of procurement approaches

R²A helps in project monitoring and management on the client side

R²A provides matched funding for development of solutions

Global perspective and peer learning

User-centered design and development in collaboration with financial authorities
The R²A process

1. INCEPTION
   Building Trust and Securing Commitment

2. USE CASE
   Value Proposition Analysis

3. GOVERNANCE
   Defining Project Parameters

4. DESIGN
   Proof of Concept

5. RESOURCING
   Pairing Sponsors with Tech Providers

6. PROTOTYPING
   Iterative Testing & Development

7. PRODUCTION
   Taking the Product to Market
The R²A approach for the demonstrations is valued by the partner financial authorities and was effective for the selection of the vendors.

There is demand from financial authorities around the world (~20) for a bite-sized intervention package as offered by R²A.

There are vendors willing to come to the table around the bite-sized intervention.

There are several important RegTech use cases that leverage APIs for info collection, ML for analysis, and NLP, which are of strong interest beyond the two R²A initial partners.

There is a demand for discussion at cross-country and cross-sector levels (e.g., Financial Crime working group).