# 28th ASEAN+3 Bond Market Forum (ABMF) Meeting and Relevant Meetings

**18-21 June 2018 / Seinan Gakuin University, Fukuoka City, Japan**

## Day 3 – 20 June 2018
**Venue: Multi-Purpose Hall, 1st Floor, Centennial Hall**

<table>
<thead>
<tr>
<th>TIME</th>
<th>PROGRAM</th>
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</thead>
<tbody>
<tr>
<td>08:30 – 09:00</td>
<td><strong>Registration</strong></td>
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<tr>
<td>09:00 – 09:05</td>
<td><strong>Opening Remarks by Mr. Seung-Kwon Lee, SF2 Chair</strong></td>
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<tr>
<td>09:05 – 09:40</td>
<td><strong>Session 12: RegTech in US</strong></td>
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<tr>
<td></td>
<td>by Mr. Hudson Hollister, Data Transparency Coalition (DTC) via Webex</td>
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<td></td>
<td>- Financial Transparency Act in US</td>
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<tr>
<td>09:40 – 10:20</td>
<td><strong>Session 13: Enhanced Supervisions and Surveillance with Technology</strong></td>
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<td></td>
<td>by Mr. Lim Kok Eng, Analytics Department, Securities Commission Malaysia</td>
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<tr>
<td></td>
<td>- XBRL submission platform</td>
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<td></td>
<td>- Web crawling robots</td>
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<td></td>
<td>- Artificial Intelligence for sentiment and text mining capability</td>
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<td>10:20 – 10:45</td>
<td><strong>Coffee break</strong></td>
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<td>10:45 – 12:15</td>
<td><strong>Session 14: Panel Discussion: Global trends in data collection and</strong></td>
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<td>standardization for more structured data</td>
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<td></td>
<td>- What are the drivers of the trends? What are benefits and costs of</td>
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<td>building structured data environment?</td>
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<td></td>
<td>- What needs to be standardized (ISO 20022, XBRL, LEI, ISIN, CFI, etc)?</td>
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<td>- How can we standardize? What is the role of international body?</td>
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<td>- What does Asia need to understand and prepare?</td>
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<td>Panelist:</td>
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<td>Mr. Francois Laurent, European Central Bank, ISO TC68</td>
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<td></td>
<td>Mr. Masayuki Tagai, JP Morgan, ISO 20022 RMG Vice Convener</td>
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<td></td>
<td>Mr. Yoshiaki Wada, NTT Data, Chair of XBRL Asia Round Table</td>
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<td>Mr. Beju Shah, Bank of England</td>
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<td>Ms. Meiko Morioka, SWIFT</td>
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<td>Moderator: ADB</td>
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<td>12:15 – 12:25</td>
<td><strong>Wrap-up by ADB Secretariat</strong></td>
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<tr>
<td>12:25 – 12:30</td>
<td><strong>Closing Remarks by Mr. Seung-Kwon Lee, SF2 Chair</strong></td>
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<tr>
<td>12:30 – 13:30</td>
<td><strong>Lunch</strong></td>
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<td>18:30 – 20:30</td>
<td><strong>Farewell Dinner, Café d’Erte, 3rd floor, Hotel Clio Court Hakata,</strong></td>
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<tr>
<td></td>
<td>5-3 Hakataekichuogai, Hakataku, Hakata, 812-0012 Fukuoka</td>
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</table>
RegTech in the United States

Hudson Hollister, Executive Director, Data Coalition
@hudsonhollister
What is RegTech?

“RegTech” refers to technological solutions that perform one of the following functions:

- Automate regulatory compliance or regulatory reporting tasks.
- Derive insights from regulatory filings or information collections.
- Efficiently share information related to complex markets or products.
RegTech is NOT:

- Limited to the financial industry or financial regulation.
- Defined by blockchain or any other particular technology.
RegTech solutions require data standardization.
Financial Transparency Act: Enabling RegTech

The Financial Transparency Act, proposed in Congress in 2015, requires U.S. financial regulators to perform the following tasks:

- Adopt data standards to govern all regulatory information collected under existing financial laws.
- Use the same data standards to both collect and publish regulatory information.

Data standards must:

- Make information fully searchable and machine-readable.
- Be nonproprietary.
- Incorporate the work of voluntary consensus bodies, like XBRL.
Financial Transparency Act: Enabling RegTech

- 2010: First proposed during Congressional consideration of the Dodd-Frank Act.
- 2016: Embraced by organizations representing 2,000 U.S. and international technology companies.
- 2018: Co-sponsored by 33 Members of the House of Representatives.
- Future: Senate introduction, committee consideration, House and Senate passage, Presidential signature.
Enhanced Capital Market Supervision & Surveillance With Technology

Lim Kok Eng
Analytics Department,
Securities Commission Malaysia

20 Jun 2018
Enterprise Analytics Roadmap

Be the central leadership for **advanced analytics** at the SC and **empower frontline** business with superior insights through advanced predictive analytics and be the **single point** for data warehousing across functions.

### Data Efficiency
- **Straight-through processing** - End-to-end processing with accurate data captured at source
  - A unified, complete, standard digitalised information disclosure system
  - An automated web data collection robot
- **Data Governance** - Establish organizational policies, procedures and standards to manage data and empower users

### Enterprise Intelligence
- **Enterprise approach** – A consolidated single source of the truth derived from multiple data sources
- **Empowering users** - Enterprise Analytics Platform to access and visualize data

### Insights
- **Advanced Analytics** - An artificial intelligence engine to provide better Insights
  - Text mining (Natural Language Processing),
  - Entity network relationship (Graph Database); and
  - Predictive modeling on Sentiment Analysis and Correlation Indexing
- **Regulator Intelligence & Analytics (RegIA) Platform**
Common Reporting Platform (ComRep)
- A robust and sustainable single submission platform

**Objectives:**
- To collect timely & quality data
- To lighten regulatory burden
- Better reporting change management

**Option 1: Offline Preparation**
- Generate XBRL Instance Document
- Secured Transmission

**Option 2: Automate Report Generation**
- SC XBRL Taxonomy
- Report Automation

**ComRep System & EDW**
- ComRep Client
- ComRep Portal
- XBRL Validation

**Enterprise Analytics Platform**
- Industry AUM Dashboard
- Source of Fund Dashboard
- Fund Overview
- Unit Trust Fund Dashboard
1. Stock Invested By Fund

2. Fund Investment In Stock Market
ComRep Platform
- Better insights with inter-connected data

1. Fund Investment in Equities Market

2. Stock Invested by Funds (Top 10)

3. Fund Investment Movement
1. Exchange website
   - PLC Corporate Announcements (CA)
   - Derivatives (DR) Market Trading Summary
2. PLCs related news, blogs & forums
3. Other Country Exchanges Trading Performance & Summary
4. Central Bank website
   - Rates & trading volume
   - Economics & Banking data
5. Bonds Information – Malaysia
6. Bond Yields - International
7. FTSE & MSCI Indices

Total 38 sites

1000+ files daily

> 150 DB tables

> 25 BI Templates + RegIA
Web Crawling Robots
- Transforming semi-structured data into structured data for analysis

Bursa Corporate Announcement Web Site

Corporate Announcement Master
Generate meaningful header for better surveillance

Change In Substantial Shareholders

Retrieval of Original announcement

Insider Moves BI
Web Crawling Robots
- Monitoring of the PLCs heartbeats
Data Governance
- Analysis begins with good quality data

• XBRL is used to manage and produce quality data

Inconsistency in Code/Name
• Inconsistent currency code

<table>
<thead>
<tr>
<th>Submitted Value</th>
<th>Standardised Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX OPT (GBP/MYR)</td>
<td>GBP/MYR</td>
</tr>
<tr>
<td>GBP-MYR</td>
<td>GBP/MYR</td>
</tr>
<tr>
<td>GBPMYO</td>
<td>GBP/MYR</td>
</tr>
<tr>
<td>GBP/MYR</td>
<td>GBP/MYR</td>
</tr>
</tbody>
</table>

Inconsistency in Value
• AUM
  Source of AUM = Allocation of AUM
• NAV
  NAV = Breakdown of Investment

Inconsistency in Definition
• Warrants classification
  Warrants are reported as Equities stocks
• Investment definition on Bonds
  • MM Instrument & Debentures or
  • MM placement & Fixed Income securities
  • Structured warrants as Structured Products
  • PLC warrants as Equities stocks

Inconsistency in Reporting Format & ID
• Standardisation of Date format
  3-2-2018 => 3rd Feb 2018 or 2nd Mar 2018
• Standardisation of identification
  - Malaysia ROC – NNNNNNNA
  - New IC – 12 numeric digits
1. Country Analysis

- Data consistency allows accurate data aggregation

1. Region Analysis
Enterprise Data Warehouse
- SEED Initiative: 4 years development from ground zero (2014 – 2017)

**EDW:** > 2 TB

**Number of ETL Programs:** > 200

**Number of files Processed in last 4 years:** > 1 mil

- Industry filing through ComRep
  - Via email
  - ComRep

- Data sourcing from internet using crawling robots
  - Manual Download
  - Web Crawling Robots

- Inter-connect the disparate internal databases
  - Disparate databases
  - Centralized database

- Automate data loading, transformation and cleansing
  - Internal Records
  - ComRep

**Databases**

- Enterprise Data Warehouse (structured DB)
- Enterprise Information Repository (Unstructured DB)
- Graph DB (Relationship DB)

**ETL Programs**

**BI Reports**

BI reports to support better operational efficiency at the Line Departments

**Manual preparation**

**BI Templates**
• Enterprise $i^3$ is designed to empower users with the capability to obtain "information at a click of a button" and the flexibility to generate own analysis to support business decisions

**Business Intelligence (BI) with Power Pivot**

**Corporate BI**
- Data is updated automatically from SQL database
- 45 sets of Corporate BI

**Self-Service BI**
- User has direct access to SQL database and can refresh the report at any point of time
- 48 sets of BI reports for 14 Departments

**@SC Site Statistics**
(YTD - up to April 2018)
- 171 Total Users
- > 27K Total Pages Viewed
- > 200 Pages Viewed Daily
1. AUM Trend Analysis

2. Bond Yields Comparison / Benchmarking
Advanced Analytics
- SC Identity (SC Id) - unique internal identifier for each entity & product

• Challenge to uniquely identify each individual and name cleansing is a tedious process

• For Example: Employees Provident Fund Board (EPF)
  - EPF has 1,918 different names in 14,285 records, due to
    ▪ Name with trustee
    ▪ English or Malay Name (EPF / KWSP)
    ▪ Short form or Full Name
    ▪ Wrong spelling
      ➢ Employees
        - Employee
        - Emplo yee
        - Employeees
        - Employe ed
        - Employment, Etc.
      ➢ Provident
        - Provien t
        - Providend
        - Provideent,
          Etc.
Regulator Intelligence & Analytics (RegIA) Platform
- The Malaysian Capital Market intelligence platform

Source
- Enterprise Data Warehouse

RegIA System
- Artificial Intelligence Engine
  - Entity / Topics Recognition
  - Relationship Recognition
  - Sentiment Recognition

Consolidated Information
- Market Overview
  - Hot topics
  - Most Discussed Company
  - Most Discussed Person
  - Overall Market Performance

- PLCs Overview (Phase 1)
  - PLCs profile & general information
  - Trading information / Analysis
  - Financial Statement
  - Directorship and key management
  - Top 30 Shareholdings
  - News, Blogs & Forums
  - Corporate announcements
  - PLC Litigation / Red List
  - Sentiment Analysis
  - Correlation Indexing
  - Entity Network Analysis

Powered by Artificial Intelligence System
Regulator Intelligence & Analytics (RegIA) Platform

- Market Overview

Natural Language Processing (NLP) Engine

Hot Topic Detection

Named Entity Recognition

Company Announcements:
- Changes in shareholdings - 2018-04-06
- AMTEL HOLDINGS BHD: NEW ISSUE OF SECURITIES - FUND RAISING - 2018-04-06

Broadcast:
- Levyat - 2018-06-12
- Biggest AI startup boosts fundraising to US$1.2 bil - The Edge Markets - 2018-06-12

Hot Topics:
1. MALAYAN BANKING BHD Management Change
2. AIRASIA BHD Management Change
3. Mohamed Shazalli Ramly, TELEKOM MALAYSIA Bhd Management Change
4. ASTRO MALAYSIA HOLDINGS BHD
5. MALAYAN BANKING BHD
6. 1Malaysia Development Bhd
7. European Central Bank

KLSE Index:
- FMIBLD, FMIB100, FMIBMG, FMIBHRA, FMIBACE

Most Discussed Companies:
1. ESOMAR
2. Bank Negara Malaysia
3. Pakatan Harapan
4. 1MDB
5. ASTRO MALAYSIA HOLDINGS BHD
6. MALAYAN BANKING BHD
7. 1Malaysia Development Bhd
8. European Central Bank
9. Nestle Malaysia Bhd
10. Kencana Finance Bhd

Most Discussed Persons:
1. Mahathir Mohamad
2. Donald Trump
3. Vodafone
4. Muhammad Ibrahim
5. Justin Trudeau
6. Jho Low
7. Emmanuel Macron
8. Anwar Ibrahim
9. Najib Razak

Companies: 5,520
Individuals: 68,238
Broadcasts: 15,466
Announcements: 200,095
RegIA Platform
- The hot topics being discussed / circulated

**Articles / Documents**

**NLP + NER**

**Topic Classification & Count**

**Top x Hot Topics**

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**Number of people / company mentioned in the article**

---

**HOT TOPICS**

- UEM SUNRISE BHD Shrinkering: 3
- NWP HOLDINGS BHD, LBS BINA GROUP BHD Joint Venture: 3
- BERJAYA CORPORATION BHD Lawsuit: 2
- M Downsizing: 2

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**NEWS / KEY DEVELOPMENTS**

**UEM Sunrise to reconsider plans for Gerbang Nusajaya**

_The Edge Markets - 2018-06-01_

KUALA LUMPUR: UEM Sunrise Bhd, which had in January engaged London-based Atkins as the master planner for Gerbang Nusajaya’s transit-oriented development (TOD) plot, will reconsider its plan following the government’s decision to scrap the Kuala Lumpur-Singapore high-speed rail (HSR) project. Sprawl...

3 x Tun Mahathir Mohamad 12 x London-based Atkins

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**UEM Sunrise looking for “catalyst” before doing Gerbang Nusajaya project**

_New Straits Times - 2018-06-01_

SUBANG JAYA: UEM Sunrise Bhd will be looking at other “catalysts” to replace the 300-acre loophole in its Gerbang Nusajaya project, following the axing of Kuala Lumpur-Singapore high speed rail (HSR). UEM Sunrise, whose Gerbang Nusajaya project will house Iskandar Puteri HSR station, is among the b...
Meanwhile, ‘09/18 and ‘10/18 Public Bank Bhd. bonds recorded a trading volume of RM60mil with yields mixed between 4.28% and 8.64%.

Among heavyweights, Maybank fell six sen to RM10.42, Public Bank was flat at RM23.94 and Tenaga eased two sen to RM15.80.

Effective April 1, VPB will become a 100% wholly-owned subsidiary of PBB. Under the terms of the foreign-owned bank licence, PBVN has been granted a term of operations of 99 years.

“In addition, Public Bank Vietnam will provide a convenient platform for the Malaysian business community to conduct business operations in Vietnam,” Teh said.
RegIA Platform

- PLC overview with sentiment analysis & correlation indexing
RegIA Platform
- PLC overview with sentiment analysis & correlation indexing
RegIA Platform

- Sentiment analysis – Provides quick reference on what is happening to a company

Articles / Documents

NLP + NER

Sentiment Analysis

Market Sentiment

**BROADCAST**

Three-pronged approach for Axiata

*The Star News* - 2018-04-21 05:17:16

JUST like how the cellular telecommunications industry is changing, Axiata Group Bhd., the regional telecoms company, is looking at a three-pronged approach towards driving its business. The stagnating cellular business has much to do with the new areas Axiata is veering in order to bring back growth...

**BROADCAST**

KLCI closes down 18pts as Maxis - TM and Maybank weigh


KUALA LUMPUR: Blue chips closed on a weak note on Wednesday ahead of the 14th General Election on May 9 as investors decided to stay on the sidelines. At 5pm, the FBM KLCI was down 18.34 points or 0.98% to 1,852.03. Turnover was 2.10 billion shares valued at RM2.43bil. There were 911 gainers, 551 losers...
RegIA Platform
- Correlation Indexing – Provides news relating to stock movements

Articles / Documents

NLP + NER

Entity Correlation

Price Movement

News List
- Axiata posts RM147m loss in Q1 on dilution loss in India’s associate
- edotco expands business model to include power services in Myanmar
- Bursa weighed by TNB, PetChem
- Celcom says ‘fully committed’ to increasing broadband speeds

Share Price Chart
## RegIA Platform
- Financial Statements & Ratios

### FINANCIALS

#### Key Stats Per Share

<table>
<thead>
<tr>
<th>Revenue/Shr (dil.)</th>
<th>EPS Excl Extra (dil.)</th>
<th>EPS Ind Extra (dil.)</th>
<th>EPS Normalized (dil.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.713764</td>
<td>0.101142</td>
<td>0.101142</td>
<td>0.108566</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Div/Shr Comm Stk Primary</th>
<th>Cash Flow/Shr (dil.)</th>
<th>Bk Val/Shr, Tot Eqty</th>
<th>Tang Bk Value, Tot Eqty</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.085</td>
<td>0.080017</td>
<td>2.739886</td>
<td>0.283044</td>
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#### Dividend

<table>
<thead>
<tr>
<th>Dividend Yield</th>
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</table>

#### Profitability Ratios (%)

<table>
<thead>
<tr>
<th>Gross Profit % Margin</th>
<th>EBITDA % Margin</th>
<th>Oper Income % Margin</th>
<th>Income Aft Tax % Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>81.1179</td>
<td>37.6103</td>
<td>12.982</td>
<td>3.8683</td>
</tr>
</tbody>
</table>

#### Growth Rates (%)

<table>
<thead>
<tr>
<th>Revenue, %Yr/Yr</th>
<th>Revenue, 5 Yr. Growth Rate</th>
<th>Revenue, 10 Yr. Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1533</td>
<td>6.6814</td>
<td>9.3344</td>
</tr>
</tbody>
</table>

### FINANCIALS

#### Income Statement

**Amount Standardised in Millions of Malaysian Ringgit**

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>Revenue</td>
<td>24,402,401</td>
<td>21,565,392</td>
<td>19,883,469</td>
</tr>
<tr>
<td>Other Revenue, Total</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>24,402,401</td>
<td>21,565,392</td>
<td>19,883,469</td>
</tr>
<tr>
<td>Cost Of Revenue</td>
<td>4,607,662</td>
<td>4,906,550</td>
<td>4,702,758</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>19,794,739</td>
<td>16,658,842</td>
<td>15,180,722</td>
</tr>
<tr>
<td>R &amp; D Exp.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Depreciation &amp; Amort., Total</td>
<td>6,609,885</td>
<td>5,595,223</td>
<td>4,170,049</td>
</tr>
<tr>
<td>Other Operating Expense(Income)</td>
<td>8,508,161</td>
<td>4,448,461</td>
<td>4,358,715</td>
</tr>
<tr>
<td>Other Operating Exp., Total</td>
<td>16,626,602</td>
<td>13,858,301</td>
<td>11,750,845</td>
</tr>
<tr>
<td>Total Operating Expenses</td>
<td>21,234,464</td>
<td>18,764,851</td>
<td>16,453,593</td>
</tr>
<tr>
<td>Operating Income</td>
<td>3,167,937</td>
<td>2,800,541</td>
<td>3,429,877</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>(1,253,369)</td>
<td>(855,257)</td>
<td>(551,817)</td>
</tr>
<tr>
<td>Interest and Invest. Income</td>
<td>241,607</td>
<td>183,394</td>
<td>173,421</td>
</tr>
<tr>
<td>Net Interest Exp.</td>
<td>(1,011,762)</td>
<td>(671,863)</td>
<td>(378,396)</td>
</tr>
</tbody>
</table>
ReglA Platform
- Entity Network Analysis

Common director in 2 companies

Radial Search  Interconnection Search
With quick access to relevant data, we can operate more efficiently and effectively in the daily surveillance work, to put all PLCs in Malaysian capital market under the radar at all time.
Thank you
Consistent application of financial data and reporting standards within and across jurisdictions remains an important unresolved legacy issue with risk management and financial stability implications. There is a need for the financial services industry, global regulators and other stakeholders to collaboratively build on their progress toward achieving a data standardization framework that addresses current deficiencies and allows innovative new technologies to be adopted. Establishing and implementing a common global language for financial instruments and transactions will create efficiency, reduce costs and result in the improved usability of financial data to create valuable information and manage systemic risk.

To support this effort:

- The Financial Stability Board (FSB) should continue to promote the consistent application of global data and reporting standards across jurisdictions and monitor the progress of adoption

- Individual jurisdictions should evaluate their individual regulatory frameworks to promote common data standards and best practices

- International standard setters such as the FSB and Bank for International Settlements (BIS) should regularly assess, in cooperation with other stakeholders, what additional new global data standards are needed

- The private sector should continue to explore opportunities to drive data standardization in market process and practices both related and unrelated to regulatory requirements
Introduction

The financial crisis of 2008 powerfully exposed operational and regulatory deficiencies across the global financial system. It made it abundantly clear that neither regulators nor financial firms had the tools necessary to quickly and accurately identify and assess the outstanding exposures of and to failing financial institutions as well as specific legal entities within these institutions. Teams of people were needed to identify the parties to transactions with troubled firms, quantify the exposures involved, and unravel a complicated web of financial structures and products. The lack of transparency and time it took to compile usable information hindered the ability of regulators and firms to respond quickly to the crisis. For example, at the time there was approximately $6.5 trillion of daily turnover in the global foreign exchange (FX) and over-the-counter (OTC) derivatives markets alone, making this no small task.\(^1\)

International and national regulators knew this information gap needed to be closed, and the industry agreed. Regulators and the financial services industry had been exploring improvements to data standardization for decades, but it took the crisis to create the imperative and regulatory will to actually make progress. At the G20’s 2009 Pittsburgh Summit\(^2\), the charter of the FSB was strengthened to address the root causes of the crisis and transform the system of global financial regulation. The need for improved data and information was specifically recognized in the FSB and International Monetary Fund (IMF) report on The Financial Crisis and Information Gaps (October 29, 2009) where it was noted, “Indeed, the recent crisis has reaffirmed an old lesson—good data and good analysis are the lifeblood of effective surveillance and policy responses at both the national and international levels.”

Since the crisis, and notably more recently, progress has been made towards the creation and required use of global data standards to serve the financial markets, particularly in derivatives markets. These data standard initiatives range from creating single elements of reference data such as the Legal Entity Identifier (LEI) to sets of data element definitions for OTC derivatives such as the Committee on Payments and Market Infrastructures (CPMI), International Organization of Securities Commissions (IOSCO) and Critical Data Elements (CDE), to full blown reporting standards such as the FSB’s Common Data Templates.

It has been critical for the industry to be part of the standard setting and regulatory processes to ensure regulatory requirements and market practices are well aligned and useable by all participants. There has been a unique collaboration among industry, regulators, and other standard-setting bodies to develop data and reporting standards and to create global systems to manage and maintain the standards.

However, considerable work remains that will require continued cooperation between regulators and the industry as well as regulatory mandates to achieve success. Global financial market participants – public and private side alike – must strengthen their commitment to these initiatives putting aside concerns about short term costs.

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\(^1\) Daily turnover in foreign exchange markets averaged $4.3 trillion in April 2007 and daily turnover in OTC interest rate derivatives averaged $2.2 trillion in April 2007, 2016 Triennial Central Bank Survey - OTC Derivatives and Foreign Exchange; BIS Monetary and Economic Department, September 2016.

\(^2\) The 2009 G-20 Pittsburgh Summit was the third meeting of the G-20 Leaders to discuss financial markets and the world economy. The G20 officially became “the premier forum for international economic co-operation”.

A Case for LEI

Consider a dealer that engages in multiple transactions with a client, ABC Bank. The dealer does not use a consistent naming standard or identifier in its recordkeeping, rather referring to its client three ways: “ABC”, “ABC Bank”, and “ABC Bank NA”. While the dealer has transacted with the same client, this is not evident from the dealer’s records due to the lack of a standardized identification approach, resulting in inefficient operations and potential identification errors.

To address these issues, the G20 asked the FSB to develop an LEI to uniquely identify legal entities that engage in financial transactions. It was clear that the benefits of a common language for legal entity identification would be significant:

• Speed and accuracy in aggregating exposures in a crisis situation
• Operational efficiency in terms of streamlined regulatory and internal reporting
• Improved client service through clearer communication
• More efficient compliance with business protocols like AML and KYC

Since 2014, over 1.1 million LEIs have been issued.

The Global LEI Foundation website has a wealth of information on the global LEI system at GLEIF.org

and effort and agree to adopt global standards for the greater good of the long term benefits to the market and to financial stability that would be achieved.

This article will examine the global imperative for data standardization, highlight the progress made to date, and take a forward look at the opportunities that can be uncovered through more robust data standardization.

Standardization And Harmonization: Is It Necessary?

A lack of data standardization and imprecise regulatory requirements result in inconsistencies in reported regulatory data across jurisdictions and business lines. Other sources of data, such as data provided by vendors, also lack standardization adding to the complexity of data management. All these factors have a significant impact on financial markets and include consequences for both risk management and efficient operational processes.

For example, standardized product and contract identification, coupled with a comprehensive set of key data elements and classification in machine-readable form has not yet been adopted in reporting regulations across
the globe adding enormous costs for end-users especially in their portfolio and risk management. Specifically, without standardization of data:

- Identification of parties involved in financial transactions cannot be quickly and accurately accomplished
- Aggregation of exposures by counterparty, product and region is more challenging
- Analysis of financial information is time consuming and inaccurate
- Management of operational risk is more demanding as manual processes are needed to collect, clean, reconcile, and consolidate data to produce useable information
- Assessment and management of global systemic risk in a timely manner may be unachievable

Further complicating the problem, regulatory reporting requirements have been developed inconsistently across jurisdictions, making it difficult to build a truly global picture of the market and to traverse the various reporting regimes. Well intentioned initiatives like swaps reporting have been less than effective, and have increased rather than decreased operational burdens due to the inconsistent reporting rules adopted by national authorities.

Regulatory reporting requirements are often disconnected from the way firms and institutions define transactions and reference data in their systems, making it necessary to explain why seemingly identical exposures differ between management and regulatory information. Creating consistency between market and regulatory nomenclature is a key area that needs continued collaboration between the industry and regulators.

The significant growth in new regulatory reporting requirements over the past few years has compounded to these issues, especially for entities that operate across jurisdictions and with multiple business lines. According to the U.S. Department of the Treasury’s Office of Financial Research (OFR), the estimated cost to the global industry from the lack of data uniformity and common standards runs into the billions of dollars.

**Key Benefits Of Data Standardization**

While the downside of inconsistent data standards is significant, the good news is that there is tremendous upside when standardization is achieved. Establishing and implementing a common global language for financial instruments and transactions, one that is universal from institution to institution, will result in unambiguous meaning, consistent formats, and improved usability of the data to create valuable information. Consistent use of such standards in regulatory reporting requirements across the globe would significantly improve the ability of the public sector to understand and identify the buildup of risk across multiple jurisdictions and across complex global financial processes. Global data standards also lead to efficiency saving time and reducing costs that firms and regulators would otherwise expend manually collecting, reconciling, and consolidating data, and will lay the groundwork for the future use of evolving technologies and innovative approaches to data management.

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4 International Swaps and Derivatives Association: The Future of Derivatives Processing and Market Infrastructure (September, 2016)
Improved Risk Management and Financial Stability

The stability of the financial system is dependent on robust systemic risk management and analysis, both of which are dependent on high quality information and data. For example:

- Better quality data supports improved risk management and decision making through the unambiguous identification of counterparties, products, instruments, and transactions.
- Good quality data facilitates processes such as payments flows, mergers and acquisitions, orderly resolution and client onboarding for small and large firms alike.
- For the public sector, good data is an imperative to support supervisory activities, which benefits both the public sector and the industry.
- High quality standardized data will allow the public sector to consider new approaches for collecting information rather than continuing to use old-fashioned and inconsistent reporting formats.
- Finally, with standardized data, collected effectively, technology could be better leveraged to improve identification of growing risks, and in the event of a future financial crisis, provide for speed and accuracy in gathering data and mitigating damages.

The importance of the financial community having strong systemic risk management capabilities cannot be emphasized enough. We have lived through times without these capabilities, and understand the consequences well. Improvements must continue to prepare us for the future.

Improved Efficiency and Cost Savings

In 2013, Ka Kei Chan and Alistair Milne published an academic paper in coordination with the School of Business and Economics Loughborough University focusing on the benefits of the broad adoption of the LEI as a global data standard and concluded that “there are about $10 billion per annum of measurable direct operational cost savings from the establishment of the global LEI in wholesale financial markets.”

The Data Foundation and PricewaterhouseCoopers published a research paper in March 2016 demonstrating that governments have the ability to reduce cost and improve the quality of data by adopting common data standards. The report cites a program where the Australian government adopted common data standards, known as Standard Business Reporting, and reportedly saved more than a billion Australian dollars in 2015.

In October 2017, McKinsey & Company and the GLEIF published a joint white paper, titled The Legal Entity Identifier: The Value of the Unique Counterparty ID. The white paper highlights the LEI’s value beyond regulatory compliance and illustrates three use cases where substantial cost can be saved and efficiency is created through the use of the LEI. The report estimates savings of 10% of operational costs for client on-boarding and trading processing - $150 million annually for the investment banking community, increasing to $500 million annually when banks engaging in trade financing are added.

Bank for International Settlements: Data as a critical factor for central banks.
PwC & The Data Foundation: Standard Business Reporting: Open Data to Cut Compliance Costs (March, 2017)
It is clear from these examples that the benefits of strategically implementing standardized data elements and reporting can be significant. The example of full standardization in Australia presents an ideal outcome producing significant benefits for the country. In other areas incremental savings are being achieved where the beginnings of standardization have occurred, as with the LEI. But these incremental improvements are just a fraction of the benefits that could be achieved if standardized data were fully integrated into databases, legal documentation, and across the entire data infrastructure of market participants.

**Supporting New Technologies**

Looking forward, having clean, standardized data is an important stepping stone to reaping the benefits of the ongoing digitization of financial assets, electronification of markets and growing use of new, cutting edge technologies, such as artificial intelligence. Many areas of the financial industry will be impacted, in some capacity, by these innovations in the coming years. These areas may include customer service, investment advice, contracts, compliance, and fraud detection. Current applications of innovations such as artificial intelligence are already visible and include natural language processing for commercial loan agreements, automated trade execution and fraud surveillance.

These new technologies, such as machine learning, for example, have the best outcomes when the data used in their processes is good, i.e., standardized, accurate, complete and timely. Said simply, good data in, good data and information out. Without standardized underlying data, the applied technology could be less effective and efficient, and the insights it produces less helpful and potentially incorrect.

Data standardization and harmonization is not only a critical step towards making the current financial industry more efficient; it will also provide a foundation for the implementation of new technologies and processes in the future.

**Progress**

As depicted in the examples below, while data standardization has been around a long time, progress on standardization has accelerated since the financial crisis.

These recent initiatives began with a call for the creation of an LEI in 2010, driven by a Policy Statement from the OFR in the United States, stating “Precise and accurate identification of legal entities engaged in financial transactions is important to private markets and government regulation”.

More recently, the mandate by European regulators that investment firms subject to the MIFID II regulation may not trade with parties that do not have an LEI has driven a near doubling of the population to over 1,100,000 LEIs issued globally to date.

In September 2014, the FSB published a study on the feasibility of a mechanism to produce and share global aggregated data (the Aggregation Feasibility Study). One of the study’s conclusions was that “it is critical for any aggregation option that the work on standardization and harmonisation of important data elements be

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10 SAS: [Machine Learning: What it is and why it matters](#)
11 Financial Stability Board: [Feasibility study on approaches to aggregate OTC derivatives data](#) (September, 2014)
completed, including in particular through the global introduction of the Legal Entity Identifier (LEI), and the creation of a Unique Transaction Identifier (UTI) and Unique Product Identifier (UPI).”

As part of this work, the FSB asked CPMI and IOSCO to develop global guidance on the harmonization of data elements that are reported to trade repositories (entities that centrally collect and maintain the records of OTC derivatives) and are important for the aggregation of data by authorities. The FSB also said it would work with the CPMI and IOSCO to provide official sector impetus and coordination for the further development and implementation of uniform global UTIs and UPIs.

New initiatives continue to emerge as well, both from the public sector and the private sector. For example: In 2017, both the CFTC Division of Market Oversight and the European Commission announced comprehensive reviews of reporting regulations to ensure that high quality data is being received and to streamline reporting. In October 2017, the International Swaps and Derivatives Association, Inc. (ISDA) published a conceptual version of its ISDA Common Domain Model (CDM), which sets out the required elements to achieve a single digital representation of trade events and actions – an important precursor to realize the full potential of new technologies, such as distributed ledger and smart contracts. The ISDA CDM will establish a common set

Unique Transaction Identifier (UTI)

In 2009, the G20 concluded that OTC derivatives ought to be reported to trade repositories (TRs), with the goal of improving transparency and mitigating systemic risk. The UTI was developed primarily to allow the unambiguous, unique identification of individual OTC derivatives transactions that regulators and supervisors require to be reported to TRs.

Receiving the data in a standardized format, with a unique transaction identifier, helps authorities to aggregate and analyze OTC transactions more effectively.

See www.bis.org/cpmi/publ/d158.htm

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12 See www.BIS.org for more information on the harmonization work.
13 A UTI is unique to a particular OTC derivative transaction. By contrast, a UPI is unique at the product level, meaning that there is a unique UPI code for each OTC derivative product. A UTI cannot be re-used to represent more than one unique transaction, while a UPI is expected to be reused whenever a particular OTC derivative product is part of an OTC derivatives transaction.
14 U.S. Commodities Futures Trading Commission: Division of Market Oversight Announces Review of Swaps Reporting Regulations (July, 2017)
The Need To Work Together

Developing global standards is a unique process requiring creativity and energy. Achieving consensus among stakeholders is a critical success factor and cannot happen without the explicit, unwavering support from the broad range of parties that participate in the financial markets. Senior level support in both the public and private sectors is necessary to maintain progress over the lengthy timeframe it takes to achieve global change.

The need for this support exists today where globally agreed upon standards such as the LEI and the UTI, while complete, are still not universally adopted. There are many jurisdictions around the world that choose to use proprietary standards rather than these globally agreed standards. There are major global processes, such as payments systems, where progress towards adopting standards has been slow and not mandated.

Consider the LEI. The global LEI system has been in place and functioning since June 2014. Despite the significant improvements in systemic risk and exposure management that result from its use, as well as the hundreds of millions in estimated cost savings, approximately 30% of global regulations requiring entity identification still do not mandate the use of an LEI. This is a significant shortcoming of the global community in achieving the huge potential of a global entity identification standard. Regulators, in particular, have a key role in achieving success as regulatory mandates can easily drive global adoption of new data standards.

Following on the heels of the LEI are the important standards that have, and are soon to be, finalized by CPMI and IOSCO. Specifically, these include key over-the-counter derivatives data elements for UTI, UPI, ISIN and CDE and include these elements in their revised rules. It would be a lost opportunity for improvement if duplicative, conflicting and overlapping data requirements were implemented as part of these revised rules and standards.

16 Bank for International Settlements: CPMI - overview
Creation and adoption of global data standards would not only allow the industry and regulatory community to operate more effectively and efficiently in today’s environment, but would facilitate the adoption of new and innovative technologies like artificial intelligence and digital data models going forward. Progress has clearly been made. Now, the financial community should strive to create real and lasting global change. To drive these efforts over the finish line, there needs to be a global call to action — a renewed attention to the need for global data standardization. Let’s finish the work that was set in motion by the 2008 financial crisis and do our best to set a strong foundation for the future. Specifically:

- The G20, through a body like the FSB, should assess and report on the state of adoption by all jurisdictions around the world of the various global reference data and reporting standards that have been created: for example, LEI, UTI, UPI and the CDE (once finalized). Jurisdictions that have not adopted such standards should be identified and urged to make progress on implementation. The FSB has addressed levels of adoption in certain country peer reviews, however, this could be more effective if done on a comprehensive basis. The FSB, through the Standing Committee on Standards Implementation (SCSI), oversees monitoring of the implementation of agreed financial reforms and the reporting of progress to the G20. Adding monitoring of the progress of adoption of global reference data standards like those indicated above to the FSB oversight and reporting processes could be very effective in driving better global adoption.

- Similarly, national regulators should consider the state of data and reporting standardization within their countries. For example, within the United States, regulatory reporting is fragmented and often duplicated and there is a lack of coordination across agencies. Each agency is focused on collecting data in its own way, with its own definitions, leading to higher cost and poorer data quality. These issues could be addressed through the use of common data standards in all financial data reporting, and enforcing best practices in data collection. In the U.S., the Financial Stability Oversight Council could take steps within its mandate to facilitate coordination among its member agencies towards the standardization of regulatory reporting requirements across the agencies.\textsuperscript{17}

- Bodies like the FSB and BIS should regularly assess, in cooperation with other stakeholders, what additional new global data standards are needed. The global financial community would greatly benefit from such ongoing and continued improvements in data standards.

- Finally, the private sector should continue to explore opportunities to drive data standardization in market processes and practices both related and unrelated to regulatory requirements.

\textsuperscript{17} Dodd-Frank Wall Street Reform and Consumer Protection Act, Sec. 112 (a)(2)(E)
XBRL, Why? and What can do for regtech?

June 2018
Chairman, XBRL Asia Round Table
NTT Data Corporation
Yoshiaki Wada
Recent trend in financial transaction and regulatory missions

- Customers/Counterparties
  - Financial transactions/trading
  - Covered by "Fintech"
  - Faster and more exotic transactions/trading

- Financial Institutions/CSD, etc.
  - Regulatory Reporting
  - Faster and more granular/variety data
  - Covered by "Regtech"

- Regulators
Expanding Regulatory Data Scope

Variety
- Non-structured
- Non-numeric
- Structured
- Numeric

More Raw Data
- Aggregate
- Sampled
- Segregate
- Every

More Processed Data
- Annual
- Monthly
- Daily
- Intra-day
- Continuous
- Periodical
- Adhoc

Granularity
Frequency
Question:

What is necessary to cope with these new trends?

One possible answer is selecting optimal data.

And second answer is expanding the data standardization.
## Data Format for Monitoring

<table>
<thead>
<tr>
<th>Monitoring Period</th>
<th>Nature of Data</th>
<th>Popular Data Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Time</td>
<td>Simple, high speed, i.e. event-log</td>
<td>CSV, TEXT</td>
</tr>
<tr>
<td>Daily</td>
<td>Slightly complicated, i.e. Transaction messaging</td>
<td>CSV, TEXT, XML</td>
</tr>
<tr>
<td>Periodical</td>
<td>Complicated, low speed, i.e. reporting</td>
<td>XML, XBRL</td>
</tr>
<tr>
<td>On-demand</td>
<td>Flexible structure, i.e. reporting</td>
<td>HTML, PDF, XML, XBRL, Excel</td>
</tr>
</tbody>
</table>
## Data Format for monitoring

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</table>

**For high speed & simple data, CSV, TEXT is suitable**

i.e. event-log

**For messaging, complicated structured report, XML and XBRL is suitable**
Why XBRL is unique and useful?

There are so many data formats:
- CSV
- XSLT
- Excel
- XML
- HTML
- PDF
- Word
- XHTML
- XBRL
Feature of XBRL (eXtensible Business Reporting Language)

### Taxonomy
- Describing the attributes/structure of element

### Instance
- Describing the value of element=fact

#### Attributes/structure

<table>
<thead>
<tr>
<th>Period</th>
<th>ABC Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td></td>
</tr>
<tr>
<td>Start Date</td>
<td>1-Apr-04</td>
</tr>
<tr>
<td>End Date</td>
<td>31-Mar-05</td>
</tr>
</tbody>
</table>

#### Consolidated Balance Sheet

<table>
<thead>
<tr>
<th>Current Assets</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash and Deposit</td>
<td>307254</td>
</tr>
<tr>
<td>Notes Receivable and Accounts Receivable Trade</td>
<td>72422</td>
</tr>
<tr>
<td>Marketable Securities</td>
<td>97359</td>
</tr>
<tr>
<td>Inventories</td>
<td>36839</td>
</tr>
<tr>
<td>Prepaied Expenses</td>
<td>71891</td>
</tr>
</tbody>
</table>

Computer can understand the structure, meaning of data, then

Data loading, calculation, analytic
Feature of XBRL (eXtensible Business Reporting Language)

<table>
<thead>
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<td>Prepared Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

XBRL is the only one technology that conveys data value and attributes/structure information in the separate files.

It needs a little bit complicated data generation and reading process, but makes unique features possible.

- **Instance**
  - Describing the value of element=fact
  - Attributes/structure of element

- **Data loading**, calculation, analytic
Standardization of reporting/messaging form (1)

For the smooth data exchange, reporting/messaging form, template and rule should be standardized and stable.

Then most data format can work efficiently.

<table>
<thead>
<tr>
<th>Case: Non-XBRL</th>
<th>Case: XBRL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Same Excel template</strong></td>
<td><strong>Same taxonomy</strong></td>
</tr>
<tr>
<td>Bank A Excel Ver. 2018</td>
<td>Bank A Taxonomy Ver. 2018 Instance for Taxo 2018</td>
</tr>
<tr>
<td>Bank B Excel Ver. 2018</td>
<td>Bank B Taxonomy Ver. 2018 Instance for Taxo 2018</td>
</tr>
<tr>
<td>Bank C Excel Ver. 2018</td>
<td>Bank C Taxonomy Ver. 2018 Instance for Taxo 2018</td>
</tr>
</tbody>
</table>

- **Excel structure information**: Should be pre-informed
- **CSV rule information**: Should be pre-informed
- **CSV rule information**: Automatically informed

For the smooth data exchange, reporting/messaging form, template and rule should be standardized and stable. Then most data format can work efficiently.
In the real world, reporting requirement is always changing, reflecting the changes in accounting rules, regulatory rules and financial conditions, etc.

Therefore, regulatory reporting form is also changing regularly or irregularly.

This causes difficulty to operate the actual reporting
Standardization of reporting/messaging form (2)

If any filer uses different reporting/messaging form or rule, and that is not informed to receiver, what will happen?

**Case: Non-XBRL**

- **Different Excel template**
  - Bank A: Excel Ver. 2018
  - Bank B: Excel Ver. 2019
  - Bank C: Excel Ver. 2018

- **New Excel structure information**
  - Bank A: OK
  - Bank B: Not-informed
  - Bank C: OK

- **Different CSV rule**
  - Bank A: Not-informed
  - Bank B: CSV Ver. 2018
  - Bank C: CSV Ver. 2019

**Case: XBRL**

- **Different taxonomy**
  - Bank A: Taxonomy Ver. 2019
  - Bank B: Taxonomy Ver. 2017
  - Bank C: Taxonomy Ver. 2018

- **Data structure information**
  - Bank A: Automatically informed
  - Bank B: OK
  - Bank C: OK
If any filer uses different reporting/messaging form or rule, and that is not informed to receiver, what will happen?

Against the changes in reporting format, XBRL has an excellent robustness, and supports the stability of regulatory framework.
Major use cases of XBRL

XBRL is already used as an de-facto standard for reporting in various cases, all over the world.

- Regulatory Reporting
- Financial/Non-Financial Disclosure
- Governmental Filings
- Central Banks, Financial/Security/Market regulators
- Business Report (e.g., IFRS other GAAP based), ESG Reporting
- Tax-filing, Pension filings, etc.
For the efficient and transparent regulatory framework, combination of optimal data format and standardization of report form/template is essential.

On the other hand, there is no reporting free from changes in form/template.

Therefore, it is particularly important to design the stable and standardized reporting form/rule, and choose the suitable data format which enables robust data supply chain.

Combination of well standardized/structured form and XBRL could contribute to the efficient data supply chain.
Thank you for your attention!
GLOBAL TRENDS IN DATA COLLECTION AND STANDARDISATION FOR MORE STRUCTURED DATA
This session is presented under Chatham House rules therefore no comments or content should be reported, attributed to the presenter or posted on social media.

The views expressed here are those of the speaker and not necessarily those of the Bank of England.
Background

- **Head of Data Collection and Publication**
  - Operational management data collection, publication and shared FCA systems
  - Management of 80+ vendors providing market / 3rd party data services
  - Design and delivery of all data collection projects

- **UK & BoE Representative(s) to the technical committees**
  - EBA, EIOPA, ESMA, ECB
  - LEI Regulatory Oversight Committee

- **Lead high profile ‘FinTech’ / ‘RegTech’ PoCs**
  - Ethereum PoC / Ripple PoC
  - Advanced XBRL data management
Post 2008: Regulatory tidal wave

- Regulations in quick succession with a massive increase in data requested
- Complex requirements + Tight Deadlines = High Cost + Tactical Solutions
- Less holistic thinking about data → poor data management → high technical debt
- Focus on just being compliant
- Can be costly
The impact of a regulatory tsunami on technology and data

- Inconsistent technical and data explanatory information published.
- Repetition / overlap of data requested
- Manual processing / validation of data
- Data quality issues
- Multiple formats
- Higher costs of software in the market
- Point solutions / poor data management
3 key themes

1. Identify what risks exist around financial institutions that need to be monitored

2. Identify the data required to monitor these risks

3. Identify the suitable technologies to collect, store and analyse this data
This is just the beginning. The foundations are in place. More could be done. How much is up to us.

The work begins now.

Key principles should be maintained:
- Vision is paramount
- Collaboration is key
- Realism and patience is essential
- This is not about shiny new tech.

Principle 2: 33. A bank should establish integrated data taxonomies and architecture across the banking group, which includes information on the characteristics of the data (metadata), as well as use of single identifiers and/or unified naming conventions for data including legal entities, counterparties, customers and accounts.

Principle 3: 37. As a precondition, a bank should have a “dictionary” of the concepts used, such that data is defined consistently across an organisation.
2015: Key principles and standards

- Standard machine readable data dictionary and data exchange format
- Data model based approach
- Automation of checks at source
- Clear and consistent data definitions, re-use of templates and data definitions
- Collect once and re-use many
- Standards / unique global identifiers
- Leverage technology and skill investments

- Single data collection platform
- XBRL (extensible business reporting language)
- LEI (legal entity identifier)
- DPM (data point modelling)
- ISO20022
2016: Setting solid foundations – Maslow’s / Data Hierarchy of Needs

- Food, water, warmth, rest shelter
- Security, safety
- Love / belonging / friends / gratification
- Self actualisation
- Portal
- BI
- Analytics
- Statistical Programs
- Data
- Security & Quality
- Governance & Policies
- Compliance & Privacy
- Data Standards
- Data Platform

Most data users start here

We are starting here

Adapted from an article by Linda Powell CDO CFPB
What is the LEI and its benefits?

• The first global and unique entity identifier

• Enables regulators to identify parties to transactions precisely and provide greater transparency.

• Levels of counterparty exposure could be linked and aggregated using the LEI e.g. different business activities, asset classes, jurisdictions and geographies

• Applications include KYC, AML, supervision, asset management, resolution etc.

“The LEI is the most basic of data reporting standards for entities. It is just a single data element”

US Office of Financial Research Jan’ 17
How the LEI could benefit a central bank’s data

- LEI
  - CRDIV
  - SII
  - SII NSTs
  - Capital +
    - Financial Forecasts
  - Structural Reform
  - Liquidity PII
  - Stress Tests
  - Sterling Money Market (SONIA)
  - CCP
  - Trade Repos
  - SFTR
  - Buy to let
  - Securities holdings
  - RTGS
  - MREL
  - MIFIDII
  - Resolution
  - Payments
  - Regulatory
  - Conduct
  - Statistics
  - Markets
  - Risk

Implemented
To be implemented
What is the Data Point Model (DPM)?

- Collaboration between business, data and technology. The subjective result of discussion and agreement.

- Dictionary of business terms. Consistent, well structured, no overlaps, etc. and a mechanism to relate to tables / templates.

- Structured representation of the data and metadata, identifying all the business concepts, relations and validation rules. Model is very stable and extensible if required.

- DPM is the technical specifications for developing an IT solution.

- DPM could be a guideline how to organise the data on reporting entity side.
What is XBRL and its benefits?

- XBRL is the international standard / programming framework for business, finance, tax and risk reporting.
- Representing a data model, dictionary, definitions, templates, the relationships between and links to the regulations as code.
- Specifying a varying complexity and severity of business validation checks, with varying tolerances.
- Automatic execution of validation checks at source / receipt.
- Representing reporting requirements at any level of granularity or aggregation.
- Improved data quality.
- Leveraging existing investments in IT and skills.
RegTech is a sub-set of FinTech that focuses on technologies that may facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities.

What RegTech could be introduced?

4.1 The innovative and diverse ideas generated by the inputs and discussions at the roundtable ranged from the use of online portals and greater use of XBRL (see glossary) for reporting through to the use of more complex and wide-reaching technology, such as artificial intelligence, shared utilities and the blockchain.

Integrate, standardise and understand

Technology that drives efficiencies by closing the gap between intention and interpretation

- **Semantic tech and data point models**
  - Technology that converts regulatory text into a programming language.
  - Machine-readable regulation would allow more automation and could significantly reduce the cost of change.
  - It could also help ensure greater consistency between the intentions of a regulation and its implementation.

- **Shared data ontology**
  - A formal naming and definition of the types, properties, and interrelationships of entities.
  - Sharing a common understanding of the structure of regulatory data would improve efficiency, reduce costs, ease interactions and help remove ambiguity.
2016 – 2017: ‘Here and now’ initiatives

• Stress Testing XBRL proof of concept
  • Manual to (more) automated, Less Excel!
  • DPM based
  • Collaboration with firms
  • Aligned to BCBS239

• Publication of the XBRL based UK Taxonomy

• New PRA reporting requirements are model based machine readable using DPM and XBRL

• Stere Money Market ISO20022 standard created

• ISO20022 standard for CCP reporting created

• LEI’s requested in all new data collections

• Retiring FSA001, FSA002, FSA014 and FSA015 is 100% re-use

• Stress Testing PoC completed successfully and go-live approved for 2018 and beyond
2017 : Short to medium term initiatives

- Expansion of the UK Taxonomy to cover
  - MREL (v 3.1 is out soon)
  - Structural Reform

- Consultation on the UK Taxonomy for Insurance
• Software vendor who has ~55% market share of banks in the UK stood up new reporting in their software in 4 hours.

• 35% reduction in firm time saved during a Stress Test week

• Reduction in ~50% of validation rules in one Stress Test template and automation of rest.

• If Insurance goes ahead - ~95% of reported data will be Digitised. Banking already ~80% digitised.

• TCO of platform reduced by ~25% over LFL contract term by adopting standards
Thank you and Questions
### ISO 20022 Adoption – Regulator initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Status</th>
<th>Planned live date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiFID II / MiFIR</td>
<td>Planned</td>
<td>Jan 2018</td>
</tr>
<tr>
<td>MMSR &amp; SMMD</td>
<td>Live</td>
<td>Apr 2016</td>
</tr>
<tr>
<td>Securities Financing Transaction Regulation (SFTR)</td>
<td>Planned</td>
<td>Jul 2018</td>
</tr>
<tr>
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Development stages of the regulatory reporting implementation

Policy stage

Int’l guidelines stage

Legal stage

Rules stage

Implementation stage

Political agenda

Supranational organisations

Governments, legislatiing bodies

Regulators

Financial institutions
## Reference Data Standards

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Reporting initiatives and repositories: Europe, Americas, Asia Pacific

Regulatory references not exhaustive