The time has come for a new approach to risk reporting

‘One of the most significant lessons learned from the global financial crisis (...) was that banks’ information technology (IT) and data architectures were inadequate to support the broad management of financial risks’.

Summary

Data controls have typically been assessed in terms of the risk to an individual institution without a broader consideration for the financial system. This in turn led to a divergence of institutional reporting practices and consistency of the data provided to the regulator.

This was clearly evidenced during the financial crisis when the ‘lack of timely accurate information hindered the ability of policy makers and market participants to develop effective responses’.

In April 2009, the G20, in consultation with the International Monetary Fund (IMF) and the Financial Stability Board (FSB) established the Data Gap Initiative (DGI) as a response to this aspect of the crisis – a request to identify, and then address, the major financial and economic information gaps across the industry.

BCBS 239 is the foundation of this regulatory journey, laying out high standards for data quality, aggregation and reporting. Organisations will, however, have a major challenge achieving the objectives BCBS 239 through their existing fragmented architectures, disparate data structures and isolated control frameworks. The BCBS have been explicit – ‘banks information technology (IT) and data architectures [are] inadequate’.

In response to this many firms will already be planning their next big data warehousing solution; a mechanism to extract data from isolated operational systems with a view to create a unified central repository of all operational data.

This paper proposes that not only is there an alternative solution, but that data warehousing is a critically flawed proposition, particularly when applied to remediate data quality issues.

Yet many organisations persist in building warehousing solutions that time and time again have proved to be ineffective. Moreover, rather than remediate poor Management Information (MI), ‘copying primary data sources into multiple secondary repositories in preparation for reuse is actually a root cause of a number of data quality issues’.

Fortunately there is now an alternative. Data Virtualisation (DV) is a highly scalable approach to data integration that adds much needed agility to the MI reporting functions.

The DV approach has become possible through the development of advanced middleware that precludes the need for data to be extracted, transformed and then loaded into a highly complex relational data structure that attempts to encompass the entirety of the business reporting requirements.

The re-usable nature of the design components within the middleware means that reporting development costs and timescales are likely to be significantly reduced – which will be of great benefit to the business in meeting aggressive regulatory timescales.

Poor regulation has historically led to poor reporting practices

The function of prudential regulation is to ‘limit financial system wide distress’.

For the Prudential Regulation Authority (PRA) this is specifically focused on identifying the systemic risks inherent in the UK financial system with a view to protecting and enhancing its resilience.

The key difference between risk at a regulatory level and risk at an institutional level is the way it is assessed. The former views the behaviour of a financial system as part of it; the latter assumes it is external to it.

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1 Basel Committee on Banking Supervision, Principles for effective risk data aggregation and risk reporting (January 2013) http://www.bis.org/publ/bcbs239.pdf
These constructs are of course not mutually exclusive. They will co-exist to varying degrees. However without appropriate regulation, risk practices and controls become divergent across different firms. The result is a lack of comparable and accurate data across the financial system.

The inadequacy of useful industry wide data can have catastrophic consequences. This was evidenced as the financial crisis spread through the global market; the ‘lack of timely accurate information hindered the ability of policy makers and market participants to develop effective responses’.

The regulatory focus has moved squarely onto data quality and governance

Swathes of regulatory initiatives have been born out of the financial crisis (figure 1). Many focus on the risk function and also on the integrity of the data being used to make decisions. The PRA’s Firm Data Submission Framework (FDSF) is perhaps the first example of this. An exercise in stock taking, it is designed to provide a ‘forward-looking assessment of the capital adequacy of the UK banking system’.

BCBS builds on this with a broader agenda of regulatory reform. What is clear across all prudential regulation is the focus on data quality. BCBS 239 is the foundation of this reform and lays the building blocks on which future prudential regulation will build.

Through 14 data principles BCBS 239 aims to address banks’ inadequate ‘information technology (IT) and data architectures’ used to ‘support the broad management of financial risks’.

Banks now face major challenges in achieving the principles of BCBS 239

Antiquated, fragmented infrastructure

Antiquated, disparate technology architectures are a key barrier to responding to the new, data related regulations. A high number of mergers and acquisitions in the finance sector over the past 30 years have been a contributory factor to this situation. Many institutions have now become heavily reliant on a patchwork of inherited systems and disparate data architectures.

The reality is that these systems were never designed to support complex analysis and reporting.

Their primary purpose was instead to automate transaction processing and are now becoming antiquated. Built in a different era, they are coded in outdated programming languages, have been subjected to decades of piecemeal upgrades and the underlying architectures are not consistent with modern design principles.

Due to the disparity and complexity of these systems, point to point interfaces have typically been preferred as the easiest means of interaction. To support data provision, rigid timing and reporting structures have subsequently been enforced.

Financial Institutions, however, are now tasked with providing accurate, timely and consistent information that can be readily aggregated. This reliance on the physical provisioning of data from legacy systems is proving to be an ever growing constraint.

Disparate data structures

With fragmented data architectures also comes isolated data governance. Ownership for risk information is often managed separately across legal entities, business lines and functions. This leads to the divergence of data models and structures that in many instances were only loosely aligned at the outset.

The outcome is a lack of standardisation across an organisation’s reporting processes. Business units are free to identify, collate and aggregate data as and how they see necessary. Reports are therefore neither comparable, traceable, or in some instances a true reflection of what it is they purport to show.

The task of aggregative reporting at an Institutional level becomes equivalent to comparing apples and oranges. This issue is exacerbated when regulatory authorities are required to draw comparison between institutions.

Building another data warehouse is not the answer

Too long, too expensive and not effective

To meet new stringent data reporting practices the knee jerk reaction for many institutions will be to begin their next big data warehousing solution.

Every organisation has been through this type of project before. It begins with the ambition of physically integrating disparate data sources into a single ‘golden source’. However it invariably ends over time and budget, with a solution that actually complicates rather than simplifying reporting practices.

The reason for this is that trying to merge disparate data structures into a single schema is extremely complex. This is compounded by the repeated replication and transformation of data.

Error prone and expensive, there is always a long list of anomalies that cause errors in the extract, load and transform (ETL) process and need to be addressed manually.

This is not to say data warehousing solutions don’t ever work - as used in the right environment, they do. However their inherent complexity requires a major investment in design effort.

Integration of a single new data item into a warehouse requires the schema to be modelled, the source mapped to the schema, the ETL written and the data moved. This is all before you can start thinking about the business and its frequently changing MI requirements. This is a hugely resource intensive and time consuming process.

This lack of agility can have catastrophic effects as organisations find themselves unable to deliver quickly the new MI requirements necessary to make critical business decisions.

This became apparent during the financial crisis – most bank’s MI architectures prevented them from being able to respond quickly to data requests. As a result ‘policy makers and market participants [were unable] to develop effective responses’².
An HMV and Spotify analogy

Prudential regulation is now calling upon organisations to alleviate the bottlenecks that are causing “capacity constraints particularly during periods of economic volatility or stress”.

However as we have just discussed, rather than remediating these bottlenecks data warehousing can actually exacerbate them.

The data warehouse supply chain can be thought as analogous to that of the now defunct music store HMV. Its effectiveness is dependent on two things: i) the ability to keep the most popular items in stock and ii) the location of its stores are convenient for their customers.

So why does this physical storage model causes such difficulties? Let’s explore the HMV analogy a little further.

HMV used to stock collections of items from different suppliers that it knows its consumers will want. In order to help customers find what they want items are classified and grouped together based on similar characteristics; rock music, video games, DVD’s. To ensure a regular and consistent supply of items the store establishes a supply chain. It finds the best supplier and agrees a regular delivery service.

Most of the time this works well. Consumers can get what they want when they want it. They know where to find the items and they are always grouped together in categories that make sense.

However the challenge comes when a customer has an urgent or ad hoc requirement for specific items that aren’t normally stocked.

In this instance there are two options. HMV could source the item. However this takes time; it requires the identification of suppliers and delivery services. HMV would then need to categorise the items within existing product ranges or perhaps even establish a new section altogether.

The only other option is to turn the customer away, leaving them to find what they need themselves. This may involve going to another store or even direct to the supplier. For the customer, sourcing the item this way is laborious and time-consuming.

Data warehousing functions much in the same way. Adapting the sourcing process to include new items in to the data warehouse is complex and takes time and effort to develop.

When business needs for new data reports are urgent users simply have no option but to source the data themselves.

This was the case during the financial crisis. Banks suddenly found that their existing MI infrastructure was unable respond quickly enough to their information demands. They were not able to integrate new data items in to their data warehousing solutions – there was simply not enough time to set up the supply chain. Instead they had to find a way to get the data themselves.

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It is time for a new approach to risk reporting

So what is Data Virtualisation?

Fortunately there is now an alternative. Data Virtualisation is a highly scalable approach to data integration that adds agility to business intelligence.

If data warehousing is like HMV then data virtualisation is like Spotify - it enables information to be browsed and used without physically moving it in to a store.

They key difference here is that while data warehousing employs a physical supply chain and storage model (the data has to be extracted, transformed and loaded into a standardised data storage environment) data virtualisation, as its name suggests, removes the need for this process.

This ‘virtualisation’ is achieved by means of a layer of middleware that supports the interaction between the data consumers and the data sources. The mechanism is termed ‘virtual’ because unlike traditional warehousing methods, the primary data sources do not need to be replicated, moved or stored.

A consequence of this is that technical aspects of the metadata, such as location, storage structure, API and access language can be ignored and complex technical taxonomies are effectively transformed into easy to understand business views.

Figure 3: Data virtualisation BI architecture

This process is crucial as it enables the creation of a hierarchical, rather than a more complex relational, schema. The benefits of these simpler schema become progressively more apparent as the level of data consolidation increases.

All that is technically required to generate a business readable view of the data is the connection of the data virtualisation middleware to the data sources, and the configuration of reusable data translation ‘service’ and ‘view’ objects within a drag and drop style API.

If a ‘view’ is the presentation of business data, then ‘services’ can be thought of as the process by which this information is obtained.

What is important is that both types of objects can call other objects to deliver new functionality. For example objects can be called that ‘perform transformation and conformance functions, which in turn call objects that perform source data access and validation functions’. The key difference to traditional data integration is that DV development employs reuse over re-engineering.

This means that data does not need to be replicated and functionality can be reused. So, like Spotify, DV skips the middleman and connects you direct to the source through a browser based architecture.

By doing so the supply chain is shortened, significantly reducing the development time of new and revised data supply solutions.

This provides flexibility and agility making it an ideal candidate in meeting the aggressive timelines of forthcoming prudential regulation.

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What are the next steps for implementing a data virtualisation solution

Take a phased approach

As we have set out, the progressive virtualisation architecture reduces development timeframes – which lends itself to a phased development approach.

Businesses considering a DV solution should start by identifying a narrow set of use cases to implement. The benefits of this are numerous. The initial investment is lower, solution development is rapid and many benefits can be realised quickly. Importantly a phased implementation can also act as proof of concept – quickly illustrating the benefits of DV to the business owners.

Agree on a data model and governance

A key challenge for organisations aggregating and consolidating data is the disparity of data models between systems. It is crucial that any DV solution avoids such pitfalls. Agreeing on a common data model will ‘ensure consistent, high quality data, make business users more confident in the data and make IT staff more agile and productive’.

To support this, organisations must set out an appropriate governance process at the outset. This will not only include how to manage the data but also ensure that the owners of shared infrastructure and services are clearly identified.

Being prepared for a new approach

Finally and perhaps most importantly is the need to justify why a DV solution is the right solution. Fortunately the answer to this question is clear; ‘banks [existing] information technology (IT) and data architectures [are] inadequate’.

New initiatives that utilise traditional data integration methods simply lack the agility to meet prudential expectations – and organisations that hope to address their fragmented architecture and disparate data taxonomies through such methods will simply be left wanting.

How Parker Fitzgerald can help

Parker Fitzgerald has an established team of regulatory specialists, change practitioners and data architects – the critical skill sets for this work.

Our experienced teams are currently assisting organisations with the following:

- Identifying key areas of opportunity to utilise data virtualisation across the risk reporting domain
- Design and integration of data virtualisation infrastructure and supporting governance
- Implementation of market leading 3rd party data virtualisation tool sets
- Testing and validation of underlying data processes and controls to support data virtualisation strategy

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Our clients include the world’s leading Banking Groups, Insurers and Asset Managers with whom we partner to deliver large and complex change arising from new financial regulation and structural reform within the industry.

Our focused service offering, commitment to quality, combined with the collective experience of our consultants has driven significant growth that has resulted in the firm being recognised as a major challenger brand within the European professional services market.

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