

HOW TO BUILD AN INFRASTRUCTURE FOR REGULATORY REPORTING



WHY READ THIS PAPER?

Are you aware of the compliance dates for reporting to the regulators? Are you ready? Think that the buy-side is not impacted? Maybe so, but are you 100% certain? Some trading scenarios may apply to the buy-side. What's an LEI? Where does it fit into the big picture? What will it mean to you? What if there are multiple SDRs for a given swap type in a given market?

These questions and concerns are real. We've heard them many times in the recent past as we participate directly in a number of industry associations and working groups. Taken together they betray a general lack of awareness and readiness for the reporting obligations on the part of derivative market participants. This is something we'd like to change.

If you work in IT at a financial services firm; if you work in derivatives operations, or risk and compliance; if you are overwhelmed with the Dodd-Frank Act rules and others; if you are responsible for implementing regulatory reform changes – then we invite you to read more about building a regulatory reporting software framework to address today's requirements, as well as those of tomorrow.

INTRODUCTION

Since the Lehman event in September 2008 much has been written about the role that OTC Derivative instruments played in the downfall of the markets. We make no attempt to duplicate any of that here. Google it if you need a refresher.

To be fair though, prior to the crash a number of primary derivatives dealers were attempting to self-regulate themselves as long ago as 2005. The G14 major swap dealers, plus a handful of buy-side firms wrote a series of letters to Timothy Geithner, who at the time was President of the New York Fed. These so-called "Fed Letters" outlined a series of commitments by the major players in the industry to improve upon certain operational aspects of derivatives processing. Among other things, these letters spawned the DTCC Trade Information Warehouse, the DerivSERV platform, and a roadmap for Collateral Management processing.

Since Lehman however, governments have taken rather more of an interest in the workings of the derivatives markets. In September 2009 the G20¹ met and agreed upon the following:

"All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements. We ask the Financial Stability Board and its relevant members to assess regularly implementation and whether it is sufficient to improve transparency in the derivatives markets, mitigate systemic risk, and protect against market abuse."

¹ G-20 membership includes the Finance Ministers and Central Bank Governors of 19 countries and the EU. www.g20.org/en

Much has since been written, and perhaps speculated, about the proposed regulations that are lumbering through the respective rule-making processes in a number of countries and economic regions, most notably the United States and Europe. In the US the comprehensive Dodd-Frank Act (DFA); passed by Congress in July 2010; represents a significant overhaul of the US Regulatory environment.

It is also worth noting that this problem domain is very much global in nature. Governments around the world continue to coordinate their efforts on an unprecedented scale via organizations such as G20, FSB², and IOSCO³. Market participants need to be careful not to fall into a trap of thinking that this is a US specific initiative. If this paper seems a little US-centric then it is entirely down to timing: Dodd-Frank is slightly ahead of the European Markets Infrastructure Regulation (EMIR) in terms of implementation, and as such, more concrete details are available. We plan to issue a follow-up paper later in the year as the EMIR timeline unfolds.

This paper attempts to achieve two things:

- First, we think there is demand for a clearing house (no pun intended) of regulatory related materials; a useful resource for market participants; a way to discover information in other places.
- Second, we outline a strategy to manage through these extraordinary times, with an emphasis on the immediate term, but with half an eye on the future. We offer practical advice on how to prepare for the tsunami of regulatory demand coming your way.

HOW THE REGS ARE SHAPING UP

As noted above, the DFA legislation is an enormous change to the financial landscape. At the time of writing 119 of a total of 398 rules⁴ have been written and finalized, so still a long way to go. A further 142 rules have yet to even be proposed. That said, those rules that are final are already being implemented, and this is generating lots of noise in the standards-body, vendor, utility, market infrastructure, and consulting spaces; not to mention the volume of white papers!

As it relates to OTC derivatives the new DFA regulations can be summarized along these four dimensions:

- **Trading.** Clearable swaps must be traded electronically where available.
- **Confirmation.** Confirmation must be completed within set timeframes.
- **Clearing.** Eligible standardized swaps must be centrally cleared.
- **Reporting.** All swaps, cleared or otherwise, must be reported to a regulator. Reports include (near) real-time and end-of-day snapshots.

² <http://www.financialstabilityboard.org/>

³ <http://www.iosco.org/>

⁴ <http://www.davispolk.com/Dodd-Frank-Rulemaking-Progress-Report/>

The scale of the activity in the US in each of the above-mentioned four functional areas is overwhelming. There's a whole new set of TLAs (see glossary at the end of this paper) to learn which is half the battle. Putting names in boxes is something of a challenge too; it's all very well understanding the process flows between SEFs and FCMs, and between MSDs and SDRs, but which firms will actually be performing these functions?

Elsewhere, ESMA recently published a consultation paper⁵ that sets out how EMIR will be implemented. The goal is to submit a final draft standard to the European Commission by the end of September 2012. EMIR is very similar to DFA with a strong emphasis on reducing counterparty risk and increasing transparency.

Outside the US and EMEA there is regulatory activity in Asia, most notably in Hong Kong, Japan, and Singapore. A summary can be found in a DFA-mandated study⁶ conducted jointly by the SEC and CFTC on how swaps are regulated in the United States, Asia, and Europe and to identify areas of regulation that are similar and other areas of regulation that could be harmonized. This is critically important to avoid regulatory arbitrage; the danger that trading flows shift to the jurisdiction with the weakest set of controls.

In this paper we focus primarily on the *reporting* aspects of the regulations.

A SLIGHTLY DEEPER DIVE

As the crisis unfolded in September 2008 very few institutions understood or were able to accurately calculate their exposure to Lehman due to the complex legal structure of hundreds of Lehman entities and vehicles. This was front and central to the regulators' thinking around addressing the issue. If market participants were to report all their trade details to a central database could we, the regulator, predict and/or prevent another Lehman?

The answer is yes, but only if there is a way to tie all the legal entities together. Most market participants have attempted to build proprietary means of linking identifiers together in the absence of an industry standard, but it's sporadic at best, proprietary to each organization, and as the crisis proved, it is clearly inadequate. However, with the backing of the G20, the FSB is driving an initiative to create a universal numbering scheme to (i) uniquely identify all legal entities, and (ii) reflect the ownership and hierarchy between organizations. The Legal Entity Identifier (LEI)⁷ utility is expected to be fully operational by March 2013.

We discuss what this might mean for firms in a little more detail further below. The simple truth is that, at the moment, the general understanding of the expected impact on systems and processes is still emerging and constantly evolving.

Similarly, it is widely acknowledged that as swaps become more standardized, and as they are traded electronically, and centrally cleared it becomes important to (i) identify the deals as they flow through the trade life-cycle, and (ii) to identify the type of swap in a consistent way. Just as

⁵ <http://www.esma.europa.eu/system/files/2012-379.pdf>

⁶ <http://www.sec.gov/news/studies/2012/sec-cftc-intlswapreg.pdf>

⁷ LEI is sometimes also referred to as the Unique Counterparty Identifier (UCI)

cash equities and fixed income instruments have standards asset classification schemes, so too will cleared swaps. Just as equity and fixed income trades have security identifiers, so too will cleared swaps.

ISDA is leading the charge on both fronts to define these new identification schemes; the Unique Product Identifier (UPI) and the Unique Swap Identifier (USI)⁸. The ISDA website⁹ maintains a page containing all sorts of useful background information relating to UPI, USI, product taxonomies, and LEI.

Precisely how these new identifiers will be used; who will own, govern, maintain them; how they will be integrated into existing message standards; is evolving on a daily basis. Will the CFTC endorse the USI and UPI? Will they be adopted globally? If I have to start reporting prior to March 2013 (when the LEI utility is expected to be operational) what do I use in the meantime to identify my swap counterparts? Keeping on top of all this is more than a full-time job.

At the time of writing, the dates for reporting in the US are still not confirmed. Originally scheduled for a two phase approach of July 16 2012 for credits and rates, and October 16 2012 for equities, FX, and commodities; these dates have slipped not least because the SEC and CFTC delayed the approvals for a definition of a “swap” and an “security-based swap” which seems incredibly ironic. Also at the time of writing the CFTC¹⁰ has granted provisional approval to become a Swaps Data Repository (SDR) to just one organization. Two others have applied but remain pending, and at least one more organization is expected to apply. A similar story is unfolding in Europe.

Despite all the uncertainty, many of the utilities, trading platforms, clearing houses, and vendors are scrambling to prepare new services and platforms to help the industry meet the regulatory requirements. Obviously there is a strong sense of competition; the first past the post will most likely clean up; if you haven't applied to be an SDR in the US by now then chances are you're too late.

At the same time; despite the intense competition; the dealers, trade associations, and standards bodies are often working together with the utilities and vendors to accelerate the development cycles in order to meet the regulatory deadlines.

There's a slightly unusual we're-all-in-this-together spirit! Next, we put ourselves in the shoes of the IT folks at a typical market participant.

⁸ USI is sometimes also referred to as the Unique Trade Identifier (UTI)

⁹ <http://www2.isda.org/identifiers-and-otc-taxonomies/>

¹⁰ <http://sirt.cftc.gov/sirt/sirt.aspx?Topic=DataRepositories>

OK, SO NOW WHAT?

Let's see if we've got this straight. You want us to start reporting to the regulators. Fine. Understood. Oh, but...

- You can't tell us when?
- You don't know who will operate the repositories?
- Some swap-types may have more than one repository you say? Hmm. How do we know which one to report to? Does it matter?
- There's no guarantee that repositories will adopt a common reporting standard? Groan.
- We need to use standard identifiers for our counterparts. OK, fair enough. But, wait, the identifiers won't be available until next year? But it will be adopted globally? Well, that's a relief then.
- For all trades we need to identify the deal, and the swap-type using standard identifier schemes. Fine, we already do this for all the equity and fixed income trades. But wait, the identifier schemes are not ready? They are not approved by the CFTC yet? There's no guarantee that other regulators will adopt them? What?
- Different data might be required by regulators in different regions and countries? OMG!

Surely you can't be serious?

Blimey. You couldn't make this stuff up. If this was an internal meeting at a bank to hand over requirements to IT then chances are the business folks would be politely told where to go!

Luckily for us, the regulators have the mother of all big sticks up their sleeve; the weight of public opinion on their side as the 99% take out their frustrations on the establishment; and all this in an election year in the US!

So, we're just going to have to suck it in and deal? Well perhaps, but we think we can do better than that.

Due to the imminent and aggressive reporting deadlines, it is clear that market participants cannot afford to wait for some of these issues to be finalized. The planning needs to start urgently if it hasn't already. Firms need to start deploying infrastructure and code very soon, even though so many questions remain unanswered. It seems obvious that we are going to have to make some assumptions. For each assumption it is useful to assess the likelihood that it will come to pass, and the potential impact to IT. Here are some suggestions:

Assumption ID	A01
Description	Multiple applications to become SDRs in the US are approved by the CFTC ¹¹
Likelihood	High. The CFTC is known to favor choice and competition. An open question remains about the longer term. Can the US market sustain multiple SDRs? We expect some consolidation over time, but not necessarily down to a single provider for all swap types.

¹¹ At the time of writing, ICE is provisionally approved; DTCC and REVAL-SDR's applications are pending. CME is widely expected to also apply.

Impact to IT	Multiple external connections, additional infrastructure requirements. Decision logic (which SDR do I report to/read from?). Multiple message and/or file formats to create/parse and maintain. Smart middleware required.
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Assumption ID	A02
Description	Applications to become SDRs under EMIR are lodged and approved by the end of 2012 ¹²
Likelihood	High. We know at least two organizations will apply. However, ESMA's views on the matter are not widely known, and given that EMIR is operating under very aggressive timelines it is entirely possible that approval is granted to only one provider.
Impact to IT	Rapid response required, once the SDR applications are approved, to meet the reporting deadline. Very likely that multiple SDRs will be in play, see A01.

Assumption ID	A03
Description	The buy-side is directly impacted by regulatory reporting, and must plan accordingly.
Likelihood	High. Although in the US the reporting impact to the buy-side is minimal at most (but still the subject of some debate, even at this late hour); the ESMA consultation paper clearly states that both sides of a trade must report.
Impact to IT	Buy-side firms operating in Europe must start preparing to report. A recent study commissioned by State Street paints a bleak picture on the general state of buy-side readiness.

Assumption ID	A04
Description	Regulatory requirements are globally harmonized.
Likelihood	Medium. The G20 and FSB and others are doing their best to encourage the regulators to work together, to agree on the requirements to the greatest extent possible. We expect some degree of overlap but we've already seen a number of key differences between DFA and EMIR
Impact to IT	A flexible design and some intelligent software that is able to satisfy requirements from multiple regulators.

Assumption ID	A05
Description	Availability of an industry standard message syntax that satisfies all the requirements.
Likelihood	High. Across the multiple regulators there is broad consensus on a majority of the data content that needs to be reported. See A04. ISDA plays two vital roles here; first they typically perform a detailed gap analysis between the requirements published by each regulator, and this forms the basis of the feedback during the public comment periods; and second, ISDA ensures that the FpML messaging standards remain compliant with the requirements.
Impact to IT	Only one syntax to worry about, but as noted in A01 and A02 there are likely to be some local customizations and extensions to consider. This

¹² Euro-CCP and REGIS-TR are expected to apply

	implies a smart middleware layer that is capable of producing the correct formats depending on the destination of each message.
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Assumption ID	A06
Description	The SDRs adopt the FpML standard as a means of communication
Likelihood	Medium. We think most SDRs will leverage the FpML standard, but we believe that others may not. We also think it is likely that alternate syntaxes may be offered by some repositories, proprietary file-based .csv specifications perhaps. Use csv to represent complex derivative instruments at your peril!
Impact to IT	If you choose to adopt FpML, good. But as noted in A05, be prepared to build logic specific to each repository. If you choose an alternative then good luck!

Assumption ID	A07
Description	SDRs will adopt a common transport layer.
Likelihood	Low. It is likely that each SDR will define their own proprietary connectivity models. VPN, leased lines, MQ, etc.
Impact to IT	Be prepared to build, manage, monitor, and maintain multiple transport/wire models, and multiple file/message protocols.

Assumption ID	A08
Description	LEI utility and infrastructure remains on target for March 2013 delivery.
Likelihood	Medium to High. We believe that there is so much attention and focus around the LEI process, governance, and implementation that the schedule will be rigidly adhered to. In the meantime the US regulators have defined an interim solution called the CICI. It remains to be seen what EMIR will do between January and March.
Impact to IT	In keeping with the spirit of this paper, it seems intuitively obvious to us that most market participants will do just enough to get by in the immediate term. The longer term implications are enormous, but at the same time, as other commentators have noted, the LEI represents all sorts of potential opportunities well beyond the scope of regulatory reporting.

Assumption ID	A09
Description	All regulators agree to adopt the USI and UPI as proposed by ISDA.
Likelihood	Medium
Impact to IT	Market participants in the US are necessarily required to deal with these new identifier schemes. We absolutely support ISDA's efforts to persuade regulators to adopt them too, and we'd like to think that common sense will prevail. However, if not then our assumption is that the FpML standard will still cover the standout regulators, and as in A05 and A06, smart software will be required to create the necessary formats required by each regulator.

We could go on, but we hope you get the point. With such a set of assumptions we at least now have a basis upon which to start thinking about designing and implementing a solution.

PROPOSED APPROACH: THINK STRATEGIC. ACT TACTICAL

As noted above, market participants do not have the luxury of time, nor do they have a perfect set of requirements. Clearly, an extremely flexible and agile approach is needed here; both in terms of the choice of technologies, and also in terms of the project management processes and methodologies.

Regardless, it seems inevitable that, at least in the immediate term, a heavy dose of quick and dirty tactical thinking is in order; just to meet the deadlines, to avoid any negative publicity and reputational risk. Nobody wants to be on the naughty list.

Perfectly understandable. However, we believe it is wise to define a strategy at the same time, so that as the tactical solutions are cranked out they should in some small way be aligned to a broader strategic plan. Also, as some of the outstanding issues mentioned above are resolved or clarified by the regulators, we can adjust as we go.

In practical terms strategies are typically tailored to an organization, so we present a generic broad based strategy here in the form of a set of guidelines and principles.

Principle Id	Principle
P01	Define strategic IT architecture
P02	Know your data
P03	Leverage industry standards
P04	Get involved

Next, we discuss each of these principles in more detail.

4 STEPS FOR IT TO ADDRESS REGULATORY REFORM

1. Define Strategic IT Architecture

Most organizations of a certain size already have an IT architecture of varying degrees of maturity. We make no attempt to replicate the fundamentals here. Perhaps your organization also has a Derivatives-specific IT strategy, one that overlies the broader IT architectural framework. Regardless of your current situation, the regulatory reporting era that is about to be ushered in represents a gilt-edged opportunity to build a reporting infrastructure that:

- **Addresses the immediate needs.** In the US this equates to Credits and Rates in the late September timeframe, followed 90 days later by Equities, Commodities, and FX. To our mind, the close proximity of the deadlines means that any Reporting Project must address all 5 swap types at once. In the UK the anticipated reporting deadline for EMIR is 1st January, 2013 but the sequence and order of swap-type reporting is not yet announced.

- **Supports requirements in multiple geographies.** There are some known differences in the reporting requirements between the US and EU. The reporting framework needs to support both, and other jurisdictions as well.
- **Supports multiple swap-types.** This is one thing that it seems we can all agree on! The five swap types are rates, credits, equities, commodities, FX.
- **Easily extensible** to support additional swaps related requirements in future.
- Extensible to support reporting requirements for **other asset classes** in the future.

Regulatory reporting, thought about at its most basic level, involves taking some data from one or more internal systems; we suspect more than one in most cases; re-formatting that data to comply with the specifications provided by the external data repositories; and finally, to deliver that data to the repository via a pre-agreed transport layer. Sounds simple enough.

Thinking back to the assumptions listed above, it is reasonable to expect that across all swap types and across all geographies most market participants will be required to build connectivity into multiple swap repositories. This leads to two obvious corollary questions:

1. Can we achieve any economies of scale at the transport layer? Perhaps, by leveraging industry standard messaging networks such as SWIFT or BT. We recommend talking to your repositories, perhaps via a collaborative industry group, to identify opportunities to connect to multiple repositories through a “single window”. Worst case, plan on building physical infrastructure to connect to each repository. This could mean running MQ over a leased lines, it could be as simple as ftp-over-the-internet.
2. Can we use a single messaging standard across multiple repositories? This is easier said than done. The regulators are generally expected to be harmonized at the data level through the efforts of the FSB and others. ISDA and FpML are working tirelessly to ensure that the FpML messaging standard represents a lowest common denominator view of the regulations so that the standard supports all regulatory jurisdictions. However, despite this, it is also reasonable to expect that repositories will impose their own restrictions and proprietary extensions. For commodities for example, SDR-1 may accept FpML 5-3 Trial Recommendation, where SDR-2 may require FpML 5-3 Recommendation.

This implies some **intelligent software** somewhere in the middle, software that is smart enough to know **how to route the data**, and what the destination-specific **formatting requirements** are, software that is easy to maintain and extend in order to keep up to date with **ever-evolving message standards**. And lastly, we think it implies an **Agile mindset**; the requirements are simply too fluid to allow a rigid traditional waterfall approach.

FpML, it seems, gets us 95+% of the way there. We think it represents the best choice by a Royal Mile. It is worth noting that if you choose to adopt a proprietary format for one particular repository, then all bets are off. Do not expect that format to match what other repositories may require.

That takes care of all the external pieces. By now, you know how your organization fits into the reporting landscape, what your external connectivity requirements are, both inbound and outbound, your physical infrastructure requirements, and your message syntax specifications. We haven’t talked here about exception handling, dashboards, monitoring, metrics, and MIS

reporting. We leave it to the reader to think about all the necessary controls that must be in place to ensure that data gets to where it is supposed to go.

Internally, the key is to integrate the “Regulatory Reporting Framework” described above with your internal systems, processes, reference data infrastructure, and general architecture. For example, you might have a SOA based set of services that know where to look for various bits of data, you might have a traditional SQL based data repository that can be used to stage the data before it is reported externally. There’s no right way or wrong way to do this. The key is being able to gather all the necessary information, at the right time, and to feed it into the Reporting Gateway. You will perhaps have noted the underlying emphasis on data in this section. This leads nicely onto a deeper discussion about data in the next section.

2. Know your data

Sounds blindingly obvious, but many organizations do not have a solid understanding of where information is held across their infrastructure, and almost none will admit to it. However, you can barely go online these days without reading about big-data-this and MDM-that. Some forward thinking banks have created a C-level role for a data specialist (e.g. Chief Data Officer); clear evidence that senior management is beginning to acknowledge the problem.

Now; thinking about your reporting obligations; it is possible, and indeed quite likely that most market participants will be required to build connectivity to multiple SDRs; whether that be a function of swap-type, or a function of geography.

Regardless of all the efforts to harmonize the regulations globally it is inevitable that there will be some regional and SDR-specific differences. It is likely that multiple message syntaxes and file layouts will be made available by the SDRs.

So, there’s work to be done here. For every SDR and every swap-type you’ll need to figure out the how and where to grab the data necessary to meet the requirements.

From a reference data perspective, the LEIs are coming. This impacts everyone. Ev-er-y-one. Fund Managers will need to register their funds (the named counterpart to a swap deal), dealers will need to register their legal entities. It’s possible that that banks named as Master Custodian to private funds will be responsible for the registering those funds. LEIs will need to be stored locally, and processes for updating and maintaining need to be defined. Some may choose to take LEIs as part of their broader market data feeds; others may prefer to deal directly with the LEI utilities. It seems clear that over time the LEI will be leveraged by a growing number of regulations. We expect that the LEI will eventually be intimately woven into the fabric of the IT and operational infrastructure at all financial institutions, well beyond the initial scope of OTC reporting. It will impact your internal processes and your external connectivity. Start preparing now.

Unlike the LEI, the USI and UPI appear destined to remain confined to the derivatives space. Nevertheless, they still need to be defined, captured, stored, and reported.

From a data model perspective it is important to understand the business context, sometimes called business metadata, for all the IT systems and infrastructure used to manage and process OTC derivatives. Having a solid grasp of the plain-English definitions and the internal “owners” of the terms, any related business rules, policies and governance will significantly impact the business analysis phase of your regulatory compliance projects.

It is also important to understand how the data flows between internal and external systems during the trade life cycle. This leads to the need for formally modeling the business process, and there are emerging standards in this space too.

We could go into much more detail about modeling data and business process here but in the interests of space we’ll leave it to you to engage with your Enterprise Architects. We leave you with one final thought and observation on the matter. If you have started thinking about MDM in your organization, but you’re struggling to get the necessary visibility and approvals, then we suggest that your Regulatory Reporting projects would be a perfect opportunity to start small.

Many organizations base their data models on industry standards, which leads us onto the next principle...

3. Leverage industry standards

Standards are typically thought of in the context of electronic connectivity, governing the syntax of the data that flows externally between companies. Increasingly, organizations are thinking about standards as the basis for their internal data models. It makes perfect sense. Why reinvent the wheel? Why build and maintain a complex data map between an internal model and an external standard? Some modern standards are themselves based on a formal underlying data model.

From a regulatory perspective we are starting to see explicit references to standards in the proposed rules. We think this is extremely refreshing and encouraging. The regulators, it seems, “get it”!

As one might expect, the leading standards body in the OTC space is FpML¹³. Responding to known and anticipated regulatory requirements has been front and center for ISDA in the past few years. A quick glance at FpML’s stated priorities for 2012 is evidence of how the messaging standard is inextricably linked to the regulatory agenda:

- Release final recommendation of FpML version 5.3 which includes the Reporting messages
- Electronic trading
- Central clearing
- Development of product taxonomies
- Development of a universal product identifier (UPI)
- Development of a universal swap identifier (USI)

¹³ www.fpml.org

But, FpML is not the only game in town. The FIX Protocol Ltd (FPL)¹⁴ is also very actively involved in responding to some of the new rules. FIXML supports the CFTC Reporting requirements for Part-20 Large Trade Reporting, for example.

SWIFT are also actively involved, perhaps more so from a commercial perspective than as a pure standards play. SWIFT is collaborating with the DTCC on two regulatory related ventures; first, the Global FX Trade Repository, and second, the LEI utility.

In record time ISO TC68 has developed a new standard for legal entity identifiers, ISO 17442. This new standard will form the basis for the LEI utilities, processes, and governance. We can't help wondering if the UPI and USI should also be brought under the ISO umbrella in order to give the proposed identifier schemes sufficient credibility to gain global acceptance.

So, all the usual suspects then? A dizzying alphabet soup of organizations, groups, committees; sometimes apparently in direct competition with each other. Perhaps some overlap in standards coverage is inevitable when the primary standard for representing derivatives is extended to support on-exchange trading, an area where other standards are dominant. Some firms will inevitably prefer to extend their existing FIX infrastructure to support swaps. Others may prefer to extend their use of FpML into the trading systems.

However, as confusing as all this may seem to the innocent, it is worth noting that the standards bodies do talk to each other, they do collaborate, and there is a strong desire to harmonize the syntaxes at the data model level. The target data model for the entire financial services industry is ISO 20022¹⁵, but it's fair to say that coverage of derivatives instruments is somewhat limited at the moment. This will change, but not quickly enough for market participants faced with building a reporting infrastructure.

So what to do?

FpML is an XML-based syntax. It is not a formal data model, nor does it contain formal business metadata. That said, it is entirely possible to derive a pretty solid data model loosely based on the FpML syntax, and as such we recommend basing your OTC Regulatory Reporting Data Model on FpML, with two cautionary notes.

- Avoid explicit alignment with a specific version of FpML, new versions are released approximately every 6 months. Pick a version as a baseline, we recommend 5.3, and then update your model over time as necessary.
- It is worth keeping in mind as you build the basic building blocks for your reporting infrastructure that although the initial focus is exclusively on swaps and derivatives sooner or later the regulators will turn their attention to other financial instruments.

Industry standards are typically open, in the public domain, and freely available to all market participants. That's great... but what about the governance of the standards? Who owns them? How are they maintained? This leads nicely onto the final principle:

¹⁴ www.fixprotocol.org

¹⁵ www.iso20022.org

4. Get involved

Regulators and other industry groups positively crave input and advice from market participants and subject matter experts. Join the debate and be part of the solution. There are a number of benefits for engaging the industry:

- Stay abreast of current thinking and latest developments. Given all the noise around regulations and the level of activity, the general lack of broad awareness and understanding; we think this is especially significant in the context of regulatory reporting.
- Exert influence on and shape the direction of the rules and/or standards for the benefit of your organization and/or your clients.
- Develop relationships with your peer organizations. You may be surprised to discover quite how open your competitors can be when discussing issues that apply to everyone in the market. Generally speaking, firms put aside their rivalries, roll up their sleeves, and work together to develop solutions to common problems.
- Reputational impact. Those organizations that actively engage very quickly become widely acknowledged as the industry experts. Priceless.

From an industry standards perspective these are *some* of the groups and organizations that are actively participating in conversations about regulatory reporting:

- FIX Protocol Ltd
- FpML Reporting Working Group
- ISITC¹⁶ Regulations Working Group
- SWIFT Derivatives User Group

And, from a regulatory perspective, here are some of the groups that are driving the agenda forward:

- SIFMA / AFMA / GFMA
- ISDA
- FSB LEI Advisory Panel
- CFTC Data Standardization Subcommittee

We're sure that there are many more in both categories, but we hope that we've piqued your interest and given you enough to be going on with for now.

We mentioned at that very beginning that the regulations are keeping the vendor community on their toes, including us. In the next section we talk about what we've been up to, and where we think we can add value to your organization.

¹⁶ www.isitc.org

C24 TECHNOLOGIES AND REGULATORY REPORTING

These may be extraordinary and unprecedented times; but they are not desperate times; not yet at least. We've described a framework to manage through it all. We have argued that by defining a solid foundation, by making some basic assumptions in lieu of a full set of requirements, and by adopting a flexible and agile approach to project management and implementation that we can avoid knee-jerk tactical desperate measures. If we're smart and we can keep our heads while others are losing theirs, we should be able to come through all this with a world-class reporting infrastructure that will meet all current requirements, and one that is easily extensible to support future requirements.

C24 Technologies can help assess, design, implement and optimize your regulatory reporting infrastructure. We are involved with many of the standards bodies mentioned in this report, we have implemented mission-critical systems for some of the largest financial institutions and we are on the forefront of agile development methodologies. We are well positioned to help market participants in three ways: (i) Product, (ii) Consultancy, and (iii) Services and Support.

Product

C24's flagship product is C24 Integration Objects (C24iO). C24iO Studio is a data modeling, meta-data management, transformation, and messaging integration toolkit based on Java data binding technology. We provide specialised Standards Libraries (message data model libraries) comprising bundled sets of components that extend the base toolkit for highly targeted scenarios. These are complete, maintained implementations of industry standards such as SWIFT MT/MX, ISO 20022, SEPA, FpML, and FIX. As part of your subscription, we provide updates to the libraries as new standards are released, e.g. supporting the latest versions of FpML, including vendor/utility specific versions of FpML for SWIFT, DTCC Global Trade Repository, and the MarkitSERV platform.

If you know of other SDR's or OTC market providers who have defined their own proprietary message formats please let us know. We can easily build support for them too.

From a run-time perspective, C24iO generates Java code for easy integration with your existing enterprise Java infrastructure.

Consultancy

We can provide two quite different types of assistance: (i) industry standards expertise and "traditional" financial services consultancy. We hope this paper demonstrates that we know a thing or two about this space; and (ii), support for adoption of agile development methodologies that bring product to market faster and more accurately than traditional 'waterfall' methods.

On the second point, it is worth noting that the traditional waterfall project management methodology is not well suited to situations with so many unknowns as we've described earlier. As noted throughout this paper, flexible, agile solutions are needed. However, "agile" is more than just a word in this context, rather it is the moniker for a relatively new (and rapidly

growing) development project management discipline. We can provide Agile specialists; people who truly understand how to work in a agile fashion, people that are needed to help implement and deploy in a fast moving and constantly changing regulatory environment.

Services and Support

Once fully trained, your developers and business analysts will be able to use the C24iO Studio to respond quickly to regulatory requirements. In the meantime we offer two ways to help, (i) we can work alongside your team in a train-as-you-go mentor model. The idea here is that at the end of the engagement you get the required deliverable, and at the same time your team is ready to fly solo on the next project; and (ii) a fixed engagement where our team will deliver to your precise specifications; this model is typically used by our clients on an ad-hoc basis, perhaps due to resource constraints.

Now to wrap things up.

SUMMARY

We have provided the background and a little history to give some context behind the current regulatory activities around the world. For further education we have provided a list of regulatory reporting resources throughout the paper, and more are provided in the following References section.

We hope that we've given you some small degree of comfort in the knowledge that if you feel like you have an incomplete understanding of the new regulations, then you are not alone. If you need assistance, it should be clear to the reader that help is out there. We hope you'll come and talk to us first.

We've tried to raise awareness of some of the groups and committees that are driving the industry forward in this space. We challenge you to join in.

We have outlined a set of critical assumptions and 4 key principles to help you think about how to build a reporting infrastructure that will satisfy the immediate demand and meet any future requirements. Ultimately, it all boils down to this:

- Be flexible, use the 80/20 rule, build to what we know now, and figure out the rest as you go along. Think Agile!
- Tactical solutions are OK, but make sure that they're all tied to an over-arching plan.
- Use industry standards internally and externally to the greatest extent possible. It almost **always** pays off in the end. Short-term workarounds almost **always** come back to bite you.
- Understand your data, what it means, where it is sourced and stored, etc. We can't stress the importance of this enough. It's all about the data.

- Be a driver, not a passenger. Get involved. Otherwise, be prepared to accept solutions that others have developed on your behalf.

OK. That's it! We hope you like what you've read. If not, we hope you'll take the time to tell us why. Our door is always open.

To learn more about C24 Technologies and C24 Integration Objects including datasheets, customer successes and reference implementations, please visit www.c24.biz or contact us at info@c24.biz.

REFERENCES

Throughout this paper we have included additional information and relevant URLs in the footnotes. Here we provide a more comprehensive glossary of many of the terms and acronyms used throughout the document, and where appropriate, we provide links to other sites for more information.

Like all white papers, this one will eventually find its way into the proverbial filing cabinet, but we think there is demand for a permanent home for reference information such as this. We have plans to build a wiki-style repository on our website in the near future.

C24	<p>C24 is a software house specializing in standards-based messaging and integration solutions aimed at the wholesale financial services markets.</p> <p>With 20+ blue-chip financial services customers and a management team with a proven history of successful start-ups and strategic partnerships with some of the technology world's most innovative players.</p> <p>The C24 Integration Objects (C24ⁱ⁰) Studio product and the financial services specific message C24ⁱ⁰ Standards Libraries are used by many of the worlds largest firms in Europe and the Americas supporting business critical applications for asset management, clearing and settlement, and payment processing.</p> <p>www.c24.biz</p>
CFTC	<p>The U.S. Commodity Future Trading Commission. An independent agency with the mandate to regulate commodity futures and option markets in the United States. The agency's mandate has been renewed and expanded several times since then, most recently by the Dodd-Frank Wall Street Reform and Consumer Protection Act.</p> <p>www.cftc.gov</p>
Davis Polk	<p>A law firm offering resources to help institutions and market participants understand and comply with the Dodd-Frank requirements and stay informed about recent rules, regulator studies, important dates and upcoming deadlines in the implementation process.</p> <p>www.davispolk.com/dodd-frank</p>
DFA	<p>Dodd-Frank Act, formally known as The Dodd–Frank Wall Street Reform and Consumer Protection Act. A federal statute in the United States that was signed into law by President Barack Obama on July 21, 2010. Passed as a response to the late-2000s recession, the Act brought the most significant changes to financial regulation in the United States since the regulatory reform that followed the Great Depression, representing a significant change in the American financial regulatory environment affecting all federal financial regulatory agencies and almost every aspect of U.S. financial services industry. The Act is categorized into sixteen titles, the most relevant (to this paper) of which is Title VII - Wall Street Transparency and Accountability.</p>

	<p>Title VII concerns regulation of over the counter swaps markets. Included in this section are the credit default swaps and credit derivative that were the subject of several bank failures in 2007. On a broader level, the Act requires that various derivatives known as swaps, which are traded over the counter be cleared through exchanges or clearinghouses.</p> <p>The Commodity Futures Trading Commission (CFTC) and the Securities and Exchange Commission (SEC) both regulate derivatives known as swaps under the Act, but the SEC has authority over "security-based swaps". The regulators are required to consult with each other before implementing any rule-making or issuing orders regarding several different types of security swaps. The CFTC and SEC, in consultation with the Federal Reserve are charged with further defining swap related terms that appear in Commodity Exchange Act and the Securities Exchange Act of 1934.</p> <p>http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/content-detail.html</p>
EMIR	<p>European Market Infrastructure Regulation. On 15 September 2010, the European Commission published its final proposal for a Regulation of the European Parliament and of the Council, which sets out to increase stability within OTC derivative markets. The Regulation introduces; a reporting obligation for OTC derivatives; a clearing obligation for eligible OTC derivatives; measures to reduce counterparty credit risk and operational risk for bilaterally cleared OTC derivatives; common rules for central counterparties (CCPs) and for trade repositories; and rules on the establishment of interoperability between CCPs.</p> <p>http://ec.europa.eu/internal_market/financial-markets/derivatives/index_en.htm</p>
End user	<p>A participant that is not a financial entity [a commodity pool operator, (e.g. hedge fund), a swap dealer, or major swap participant] that is using a swap to hedge or mitigate commercial risk.</p>
ESMA	<p>ESMA is an independent EU Authority that contributes to safeguarding the stability of the European Union's financial system by ensuring the integrity, transparency, efficiency and orderly functioning of securities markets, as well as enhancing investor protection. In particular, ESMA fosters supervisory convergence both amongst securities regulators, and across financial sectors by working closely with the other European Supervisory Authorities competent in the field of banking (EBA), and insurance and occupational pensions (EIOPA).</p> <p>www.esma.europa.eu</p>
FIX Protocol	<p>FIX Protocol Ltd (FPL). The Financial Information eXchange (FIX) Protocol is a messaging standard developed specifically for the real-time electronic exchange of securities transactions. FIX is a public-domain specification owned and maintained by FIX Protocol, Ltd.</p> <p>FIX's mission is to improve the global trading process by defining, managing, and promoting an open protocol for real-time, electronic communication between industry participants, while complementing other industry standards.</p>

	<p>www.fixprotocol.org</p>
FpML	<p>Financial Products Markup Language, <i>the</i> standard for the derivatives industry. FpML’s stated mission is “To streamline the process supporting trading activities in the financial derivatives domain through the creation, maintenance and promotion of an e-business language for describing these products and associated business interactions based on industry standards.”</p> <p>FpML is the business information exchange standard for electronic dealing and processing of financial derivatives instruments. It establishes a protocol for sharing information on, and dealing in swaps, derivatives and structured products. It is based on XML, the standard meta-language for describing data shared between applications. All categories of over-the-counter (OTC) derivatives will eventually be incorporated into the standard.</p> <p>The standard, which is freely licensed, is intended to automate the flow of information across the entire derivatives partner and client network, independent of the underlying software or hardware infrastructure supporting the activities related to these transactions. FpML is of value when the direct communication of derivative trade descriptions and environment information between two firms is desired. Ultimately, it will allow for the electronic integration of a range of services, from Internet-based electronic dealing and confirmations to the risk analysis of client portfolios.</p> <p>www.fpml.org</p>
FSB	<p>The Financial Stability Board. The FSB has been established to coordinate at the international level the work of national financial authorities and international standard setting bodies and to develop and promote the implementation of effective regulatory, supervisory and other financial sector policies in the interest of financial stability.</p> <p>www.financialstabilityboard.org</p>
G20	<p>The Group of Twenty is the premier forum for international cooperation on the most important aspects of the international economic and financial agenda. It brings together the world’s major advanced and emerging economies. The G20 includes 19 country members and the European Union, which together represent around 90% of global GDP, 80% of global trade and two-thirds of the world’s population. The objectives of the G20 are:</p> <ol style="list-style-type: none"> 1. Policy coordination between its members in order to achieve global economic stability, sustainable growth 2. To promote financial regulations that reduce risks and prevent future financial crises 3. To create a new international financial architecture. <p>www.g20.org/en</p>
IOSCO	<p>The International Organization of Securities Commissions. Recognized as the international standard setter for securities markets. Its membership regulates more than 95% of the world’s securities markets and it is the primary international</p>

	<p>cooperative forum for securities market regulatory agencies. IOSCO members are drawn from, and regulate, over 100 jurisdictions.</p> <p>www.iosco.org</p>
ISDA	<p>International Swaps and Derivatives Association, fosters safe and efficient derivatives markets to facilitate effective risk management for all users of derivative products.</p> <p>ISDA achieves its mission by representing all market participants globally, promoting high standards of commercial conduct and leading industry action on derivatives issues. This includes being:</p> <p><i>The Source for Robust and Trusted Documentation</i></p> <ul style="list-style-type: none"> • Providing standardized documentation globally to ensure legal certainty and maximum risk reduction through netting and collateralization <p><i>The Architect of a Secure and Efficient Infrastructure</i></p> <ul style="list-style-type: none"> • Promoting infrastructure that supports an orderly and reliable marketplace as well as transparency to regulators <p><i>An Advocate for Effective Risk Management and Clearing</i></p> <ul style="list-style-type: none"> • Enhancing counterparty and market risk practices and advancing the effective use of central clearing facilities and trade repositories <p><i>The Voice for the Global Derivatives Marketplace</i></p> <ul style="list-style-type: none"> • Representing the derivatives industry through public policy, ISDA governance, ISDA services, education and communication <p>www.isda.org</p>
ISITC	<p>International Securities Association for Institutional Trade Communication, supports global securities operations, to promote Straight Through Processing throughout the industry, to develop standards and market practices designed to enhance efficiency, and to use the combined expertise of its members to address developments within the industry. These standards range from transaction initiation/confirmation through settlement and subsequent downstream processes for corporate actions, reconciliation and securities lending. In addition, the organization focuses on a variety of products and transaction types including OTC Derivatives, Repos, Factor-based Securities and Transfers. ISITC market practices are widely adopted by the industry and enable efficiency gains for the entire community of users.</p> <p>www.isitc.org</p>
ISO	<p>International Organization for Standardization is the world's largest developer of voluntary International Standards. ISO is an independent, non-governmental organization made up of members from the national standards bodies of 164 countries. Standards give state of the art specifications for products, services and good practice, helping to make industry more efficient and effective. Developed through global consensus, they help to break down barriers to international trade.</p> <p>ISO Standards cover almost all aspects of technology and business. From food</p>

	<p>safety to computers, and agriculture to healthcare.</p> <p>www.iso.org</p>
LEI	<p>Legal Entity Identifier (aka Universal Counterparty Identifier, UCI). LEI will be used for precise, reliable, and unique identification of each party to a swap, in all recordkeeping and data reporting concerning swaps.</p>
MSP	<p>Major Swap Participant. As defined by Section 721 of DFA: An entity that: (1) maintains a substantial position in swaps for any of the major swap categories as determined by the CFTC (excluding positions held for hedging or mitigating commercial risk and positions maintained by any employee benefit plan for the primary purpose of hedging or mitigating any risk directly associated with the operation of the plan); (2) has substantial counterparty exposure that could have serious adverse effects on the financial stability of the U.S. banking system or financial markets; or (3) is a financial entity that is not subject to capital requirements imposed by any federal banking agency, is highly leveraged relative to the amount of capital it holds and maintains a substantial position in outstanding swaps in any major swap category.</p>
PET	<p>Primary Economic Terms, as defined in DFA; the economic terms of a swap that include all of the terms of the swap verified or matched by the counterparties at or shortly after the execution of the swap.</p>
SEC	<p>U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation. The SEC requires public companies to disclose meaningful financial and other information to the public. The result of this information flow is a far more active, efficient, and transparent capital market that facilitates the capital formation so important to the U.S. economy.</p> <p>The SEC oversees the key participants in the securities world, including securities exchanges, securities brokers and dealers, investment advisors, and mutual funds. Here the SEC is concerned primarily with promoting the disclosure of important market-related information, maintaining fair dealing, and protecting against fraud.</p> <p>Though it is the primary overseer and regulator of the U.S. securities markets, the SEC works closely with many other institutions, including Congress, other federal departments and agencies, the self-regulatory organizations (e.g. the stock exchanges), state securities regulators, and various private sector organizations. In particular, the Chairman of the SEC, together with the Chairman of the Federal Reserve, the Secretary of the Treasury, and the Chairman of the Commodity Futures Trading Commission, serves as a member of the President's Working Group on Financial Markets.</p> <p>www.sec.gov</p>
SEF	<p>Swap Execution Facility. As defined by Sections 721 and 733 of DFA. A facility, trading system or platform in which multiple participants have the ability to execute or trade swaps by accepting bids and offers made by other participants that are open to multiple participants in the facility or system, through any means of interstate commerce.</p>
SD	<p>Swap Dealer. As defined by Section 721 of DFA: A firm that holds itself out as a dealer in swaps; makes a market in swaps; regularly enters into swaps with</p>

	counterparties in the ordinary course of its business for its own account; or engages in any activity causing the person to be commonly known in the trade as a dealer or market-maker in swaps.
SDR	Swaps Data Repository, the facilitator of the transparency requirements. The SDR disseminates to the public and the CFTC swap data on a real-time basis.
SWIFT	<p>Society for Worldwide Interbank Financial Transfer. A member-owned cooperative through which the financial world conducts its business operations with speed, certainty and confidence. More than 10,000 financial institutions and corporations in 212 countries trust us every day to exchange millions of standardised financial messages. This activity involves the secure exchange of proprietary data while ensuring its confidentiality and integrity.</p> <p>Our role is two-fold. We provide the proprietary communications platform, products and services that allow our customers to connect and exchange financial information securely and reliably. We also act as the catalyst that brings the financial community together to work collaboratively to shape market practice, define standards and consider solutions to issues of mutual interest.</p> <p>www.swift.com</p>
UPI	Universal Product Identifier. UPI will be used for categorization of swaps with respect to the underlying products referenced in them.
USI	Universal Swap Identifier (aka Universal Trade Identifier). USI will be created and assigned to a swap at the time it is executed, and used to identify that particular swap transaction throughout its existence.