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July 18, 2016

Via email: rule-comments@sec.gov
Brent J. Fields
Secretary
U.S. Securities and Exchange Commission
100 F Street NE
Washington, DC 20549-1090

COMMENT LETTER

Re: Joint Industry Plan; Notice of Filing of the National Market System Plan Governing the Consolidated Audit Trail, (Release No. 34-77724; File No. 4-698)

Dear Secretary Fields:

Bloomberg, LP ("BLP") appreciates the opportunity to comment on the above-captioned notice ("Notice"), under which BATS Exchange, Inc., BATS– Y Exchange, Inc., BOX Options Exchange LLC, C2 Options Exchange, Incorporated, Chicago Board Options Exchange, Incorporated, Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc., International Securities Exchange, LLC, ISE Gemini, LLC, Miami International Securities Exchange LLC, NASDAQ OMX BX, Inc., NASDAQ OMX PHLX LLC, The NASDAQ Stock Market LLC, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc. (collectively, ''SROs'' or ''Participants''), propose an amendment to a National Market System Plan Governing the Consolidated Audit Trail (the ''CAT NMS Plan'' or ''Plan'').[1]

BLP, the global business and financial information and news leader, gives influential decision makers a critical edge by connecting them to a dynamic network of information, people and ideas. The company's strength – delivering data, news and analytics through innovative technology, quickly and accurately – is at the core of the Bloomberg Professional service, which provides real time financial information to more than 325,000 subscribers globally. The comments on the CAT NMS Plan set forth herein are based on BLP's deep expertise in transaction reporting and analytics.

The CAT NMS Plan was submitted by the SROs as required by Rule 613. Rule 613 requires the

[1] 81 F.R. 30614 (May 17, 2016).

SROs to submit a national market system plan to create, implement and maintain a consolidated audit trail (CAT) and a Central Repository for the CAT data.[2] Pursuant to § 11A of the Securities Exchange Act of 1934 (the "Act")[3] and Rule 608 thereunder,[4] the U.S. Securities and Exchange Commission ("Commission") is publishing the SROs' proposed amendment and seeking comment on both the proposed amendment and the potential economic impacts of implementing the CAT NMS plan, as proposed to be amended.

As will be discussed further, the current CAT NMS plan fails to address critical elements that undermine the ability of the program to succeed and imposes significant, unnecessary costs upon the public.

A. Background

Providing regulatory supervision and oversight of increasingly interconnected, global financial markets requires a modern approach to data infrastructure that allows regulators to aggregate, manipulate, and analyze data across assets classes, entities, and markets. On July 11, 2012, the Commission adopted Rule 613 of Regulation NMS under the Act[5] to begin the process of building such a system to capture customer and order event information for orders in NMS securities, across all markets, from the time of order inception through routing, cancellation, modification, or execution in a single, consolidated data source.[6] Pursuant to the rule, on September 30, 2014, the SROs submitted a NMS plan for the creation, implementation, and maintenance of a consolidated audit trail, including a central repository to receive and store consolidated audit trail data which was replaced with a later submission from the SROs on February 27, 2015.[7]

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[2] 17 CFR 242.613(a)(1). More specifically:

> Rule 613 requires the Participants to ''jointly file . . . a national market system plan to govern the creation, implementation, and maintenance of a consolidated audit trail and Central Repository.'' The purpose of the Plan, and the creation, implementation and maintenance of a comprehensive audit trail for the U.S. securities market described therein, is to ''substantially enhance the ability of the SROs and the Commission to oversee today's securities markets and fulfill their responsibilities under the federal security laws. It will allow for the prompt and accurate recording of material information about all orders in NMS securities, including the identity of customers, as these orders are generated and then routed throughout the U.S. markets until execution, cancellation, or modification. This information will be consolidated and made readily available to regulators in a uniform electronic format.'' 81 FR 30614, 30618 (May 17, 2016).

[3] 15 U.S.C. 78k-1.

[4] 17 CFR 242.608.

[5] See Securities Exchange Act Release No. 67457 (July 18, 2012), 77 FR 45722 (August 1, 2012) ("Adopting Release"); see also Securities Exchange Act Release No. 62174 (May 26, 2010), 75 FR 32556 (June 8, 2010) ("Proposing Release").

[6] See 17 CFR 242.613(a)(1), (c)(1), (c)(7).

[7] See Letter from Participants to Brent J. Fields, Secretary, Commission, dated February 27, 2015. Pursuant to Rule 613, the SROs were required to file the CAT NMS Plan on or before April 28, 2013. At the SROs' request, the Commission granted exemptions to extend the deadline for filing the CAT NMS Plan to December 6, 2013, and then to September 30, 2014. See Securities Exchange Act Release Nos. 69060 (March 7, 2013), 78 FR 15771 (March 12, 2013); 71018

On November 21, 2013, the SROs submitted a separate NMS plan for selecting a Plan Processor[8] (the "Selection Plan") pursuant to Rule 608 governing the SROs' review, evaluation, and ultimate selection of the Plan Processor for administering the consolidated audit trail which was approved by the Commission on February 21, 2014.[9]

Further amendments to the Selection Plan were approved on June 17, 2015 and September 24, 2015[10] and these amendments are included in the current CAT NMS plan. An exemption from certain requirements of Rule 613 was approved by the Commission on March 1, 2016.[11] [12] The current submission reflects these exemptions as well.

B. The current CAT NMS plan fails to address critical data elements necessary for the Commission to fulfill its trade reconstruction, market manipulation surveillance and investor protection mandates.

When the Commission approved the proposed CAT NMS plan, various Commissioners spoke to the CAT NMS Plan's importance. Chair White noted that:

> The Commission's action to approve the proposed CAT plan for public comment is a major market structure milestone. CAT will enable regulators to harness today's technology to enhance the regulation and oversight of today's

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(December 6, 2013), 78 FR 75669 (December 12, 2013). The SROs filed the CAT NMS Plan on September 30, 2014. See Letter from the SROs, to Brent J. Fields, Secretary, Commission, dated September 30, 2014. The CAT NMS Plan filed on February 27, 2015, was an amendment to and replacement of the Initial CAT NMS Plan. Unless the context otherwise requires, the ''CAT NMS Plan'' shall refer to the Amended and Restated CAT NMS Plan submitted on February 27, 2015.

[8] As set forth in Section 1.1 of the CAT NMS Plan, the Plan Processor ''means the Initial Plan Processor or any other Person selected by the Operating Committee pursuant to SEC Rule 613 and Sections 4.3(b)(i) and 6.1, and with regard to the Initial Plan Processor, the Selection Plan, to perform the CAT processing functions required by SEC Rule 613 and set forth in [the CAT NMS Plan].''

[9] See Securities Exchange Act Release No. 70892 (November 15, 2013), 78 FR 69910 (November 21, 2013) (''Selection Plan Notice''), Securities Exchange Act Release No. 71596, 79 FR 11152 (February 27, 2014) (''Selection Plan Approval Order'').

[10] See Securities Exchange Act Release Nos. 75192 (June 17, 2015), 80 FR 36028 (June 23, 2015) (Order Approving Amendment No. 1 to the Selection Plan); 75980 (September 24, 2015), 80 FR 58796 (September 30, 2015) (Order Approving Amendment No. 2 to the Selection Plan); Letter from SROs to Brent J. Fields, Secretary, Commission, dated March 29, 2016; see also Securities Exchange Act Release Nos. 74223 (February 6, 2015), 80 FR 7654 (February 11, 2015) (Notice of Amendment No. 1 to the Selection Plan); 75193 (June 17, 2015), 80 FR 36006 (June 23, 2015) (Notice of Amendment No. 2 to the Selection Plan).

[11] See Letter from Participants to Brent J. Fields, Secretary, Commission, dated January 30, 2015 (''Exemptive Request Letter'').

[12] See Securities Exchange Act Release No. 77265 (March 1, 2016), 81 FR 11856 (March 7, 2016) (''Exemption Order'').

> trading markets. It will significantly increase the ability of regulators to conduct research, reconstruct market events, monitor market behavior, and identify and investigate misconduct.[13]

Commissioner Kara Stein noted:

> The true value of the CAT lies in tracking market orders from start to finish across multiple venues. It will also allow us to see how an order interacts and affects other orders in our markets. Dislocations can be spotted and understood. Abuses can be revealed. Moreover, by peering into the flow of trading in our markets, we can develop policies and approaches that are based on real data.[14]

Commissioner Michael Piwowar noted that the CAT NMS plan was an important step "toward the ultimate feat of introducing a new and incredibly powerful regulatory tool."[15]

The markets do not trade in silos. Today, huge trading volumes flow across markets in execution of cross-asset, cross-product and cross-market strategies, propagating market shocks instantaneously. The May 6, 2010 Flash Crash, October 15, 2014 Treasury Market Crash and August 24, 2015 disruption all illustrate how quickly price discovery and trading can be disrupted.

Efforts by market regulators to deconstruct these events and understand their causes is significantly hampered by massive data gaps and difficulty combining and analyzing the relevant data that does exist. A robust CAT combined with an expanded SEC Market Information Data Analytics System (MIDAS)[16] to include data from other asset classes is the cornerstone in achieving the SEC's objective of reconstructing market events, surveilling market behavior, and finding and addressing misconduct.

Development of CAT NMS unfolds on a rapidly evolving data landscape significantly impacting the requirements necessary for CAT's success. A deficiency in the current plan is that section 6.3, "Data Recording and Reporting by Participants", does not require the use of an identifier and symbology for reporting to the Central Repository that will allow regulators and SROs to aggregate, analyze data collected from various sources including the CAT NMS.

In order for CAT to work at all, the metadata necessary for aggregation and analysis needs to be attached to the reported records. In order for CAT to work most efficiently, that metadata needs to be encoded with the record from the beginning of a record's lifecycle using a comprehensive,

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[13] See, SEC Seeks Public Comment on Plan to Create A Consolidated Audit Trail, April 27, 2016 at: https://www.sec.gov/news/pressrelease/2016-77 html

[14] See opening statement of Commissioner Kara M. Stein, https://www.sec.gov/news/statement/stein-statement-open-meeting-cat-042716.html (April, 27, 2016.

[15] See Opening Statement of Michael S. Piwowar, https://www.sec.gov/news/statement/piwowar-open-meeting-042716 html (April 27, 2016).

[16] See https://www.sec.gov/marketstructure/midas.html.

structured instrument identifier system. Failure to include the necessary metadata with a record at the time it is reported makes the ultimate goal of cross-platform, cross-asset aggregation and surveillance significantly more difficult and prone to error.

This could present a burden on industry as, somewhere in the process of CAT reporting, transactions will have to be translated into a common symbology and nomenclature in order to be aggregated and analyzed. Either the members, the SROs or the Central Repository will face costs to build this infrastructure that they have to pass on to their users, particularly for asset classes such options that are not currently subject to OATS. The Commission noted in its release, it believes in equities that the requirement to use the listing exchange's symbology format is likely to be a significant source of costs.[17] We believe this observation also applies to options.

The CAT NMS plan is not just, as many view it, an upgrade to the Financial Industry Regulatory Authority ("FINRA") Order Audit Trail System ("OATS")[18] that includes options. It is an opportunity to ensure there is an appropriate data hierarchy with a robust and flexible identifier symbology that can avoid the complex web of mappings required to tie together the different fragmented identifier schemes. It helps avoid the costs the Commission is concerned about related to adoption of or mapping to new symbologies. The Commission should not miss the opportunity to have an identification symbology that provides not only an integrated view of equities and options, but also transparency into other markets that influence equities and options, and may reduce reporting complexity and costs for the industry and regulators overall.

This can be accomplished, at lowest cost to the public, through requiring the adoption of an identifier that has the following characteristics:

1) **Uniform and Global--**It should have the approval of an independent standard setting organization with international representation so that it is a uniform standard and it is verified that any identifier can encode the necessary metadata to allow appropriate classification and aggregation.

2) **Open Data Standard--**To avoid the conflicts associated with closed, single source identifiers that become profit centers for the parties issuing them, an identification standard should have an open license that is available for anyone to use. All else being equal, open data standards should be favored over closed, proprietary data standards.

3) **Multi-Asset--**The identification standard should be able to cover multiple asset classes and be forward compatible with new asset classes.

The importance of this point, and its ability to save the industry, the SROs and the Commission substantial time and resources is substantial. Without a standardized, effective data nomenclature--beginning with a workable symbology and identifier, the successful integration of ***any*** transaction reporting system with surveillance is significantly more difficult. Success in CAT must be built

[17] 81 F.R. 30614, 30730.

[18] See https://www.finra.org/industry/oats.

upon a uniform, global, open, multi-asset identifier.

The Financial Instrument Global Identifier ("FIGI")[19] is an example of such an identifier and how it can work. FIGI was developed by BLP to establish an identifier and symbology that could be used across product lines and markets and solve shortcomings of existing identifiers. Recognizing the utility of a uniform, global, open, multi-asset identifier for our clients and financial markets, BLP assigned all rights and interests in FIGI to the Object Management Group ("OMG") who now administers FIGI as an open data standard. BLP has been chosen by the OMG to be the Registration Authority for FIGI numbers.[20] A listing of the fields and description of the metadata included in a FIGI number is attached as Appendix 2. [21]

FIGI, with 5 million identifiers issued per month and over 300 million identifiers issued in total to date, is perhaps the largest, most comprehensive numbering system that provides unique identification at multiple levels of granularity across asset classes. In the case of Markets in Financial Instruments Directive ("MiFID") II,[22] FIGI provides identity for instruments that existing number systems such as International Securities Identification Number ("ISIN") cannot. [23] As it is open source, FIGI is the only standard identification symbology that is a fee-free, license-free activity as per the requirements set out by the OMG.

Huge grids of contextual and identification information map and remap trades throughout the life cycle of a trade. CAT's adoption of a standard with the characteristics of FIGI would simplify cross-asset surveillance, lowering error rates and potentially lowering symbology licensing costs of plan participants and their members. This includes the ability to use a single symbology to differentiate the same instruments traded on multiple exchanges, while preserving their identity and allowing aggregation across venues. A uniform, global, open, multi-asset identifier, whether it is FIGI or some other similar standard, provides the metadata that builds the foundation for regulators being able to classify, aggregate, and analyze the data collected under CAT. Given that this is the very purpose for CAT NMS, Section 6.3 should be amended, therefore, to include the requirement

[19] See http://www.omg.org/spec/FIGI/1.0/ (The FIGI standard is also attached as Appendix 1).

[20] Further information on obtaining FIGI numbers is available at: https://www.openfigi.com/.

[21] May also be accessed at https://assets.bwbx.io/openfigi/public/assets/content/Open_Symbology_Fields-2a61f8aa4d.pdf.

[22] Proposal for a Directive of the European Parliament and of the Council on Markets in Financial Instruments Repealing Directive 2004/39/EC of the European Parliament and of the Council (Recast), COM/2011/656/Final (October 20, 2011).

[23] https://www.isin.org/isin/. For example, ISINs, which are proposed to be used by the European Securities and Markets Authority ("ESMA") are not unique for multi-listed securities, they do not have complete coverage for derivatives and more complex asset classes, and assignment of ISIN numbers is not consistent across National Numbering Agencies. This means a particular ISIN does not identify a particular instrument traded on a particular venue, unlike a FIGI number. ESMA's reliance on an identification nomenclature that does not ensure the identify of transactions or provide numbers for many existing types of transaction, places market participants in an untenable position of not being able to comply with regulations and stymies regulators' ability to aggregate and analyze the data reported by market participants.

that the Plan Processor adopt a uniform, global, open, multi-asset identifier.

C. The CAT NMS plan should specify that independent software vendors should be able, at the request of their clients, to have fair, reasonable, and non-discriminatory access to data submitted or stored at the Central Repository on their client's behalf.

Section 6.5(c) of CAT NMS provides that:

> [T]he Plan Processor shall provide Participants and the SEC access to the Central Repository (including all systems operated by the Central Repository), and access to and use of the CAT Data stored in the Central Repository, solely for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules and regulations or any contractual obligations.

Because there are other uses for securities transaction reporting systems, 6.5(c) should be amended to allow independent software vendors fair, reasonable, and non-discriminatory access to the data on behalf of the data owner for their own internal business purposes.

In OATS, for example, one broker's new order sent is another's new order received. Last year, FINRA started to provide participants access to their OATS data to determine reporting accuracy by "matching in both directions." Prior to this functionality, participants were fined without any easy way of knowing that errors existed – there was no easy way for a broker to determine that the way they had reported the new order sent was consistent with how the destination broker had reported the new order received. Fair, reasonable, and non-discriminatory access to their own data was not an initial requirement of FINRA's OATS plan. The CAT Plan can avoid this delay. Accurate data with which to conduct their missions is what regulators need, not time spent chasing down reporting violations that could have been avoided through better access to reported data.

Independent software vendors can build sophisticated analytics that aid in this. For example, such data may be useful to conduct internal surveillance and compliance activities. Moreover, the analytics can provide other insights that may not be explicitly mandated by a specific regulatory requirement – for example, insight into the data owner's business practices.

D. Retirement of Existing Systems

The retirement of existing reporting systems superseded by CAT NMS must be addressed in the implementation of CAT NMS. According to the CAT NMS plan release, "the Commission preliminarily believes that the period of duplicative reporting could last at least 2 years and the period of system retirement could extend for up to 2.5 years after Industry Members begin reporting data." [24] This would place an unacceptable burden on Broker Dealers as they absorb the costs of maintaining multiple, parallel systems.

[24] SEC Release No. 34-77724; File No. 4-698; Section IV.F.2 (pp. 473-476).

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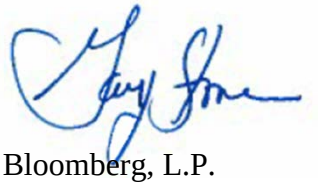
The Commission should specify an appropriate error rate for CAT NMS reporting that, once CAT reporters meet it, CAT reporters can end duplicative reporting and retire superseded systems such as OATS. Any trial period required should not be longer than 6 months.

Thank you again for the opportunity to comment.

If you have any questions or you would like to discuss these matters further, please do not hesitate to contact Eric Juzenas in our Global Regulatory and Policy group at ejuzenas@bloomberg.net or 202-805-2038.

Respectfully submitted,



Bloomberg, L.P.

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Chief Strategy Officer for
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Global Regulatory and Policy Group

Date: November 2015

Financial Instrument Global Identifier® (FIGI™)

v1.0

OMG Document Number: formal/2015-12-01

Standard document URL: http://www.omg.org/spec/FIGI/1.0

Normative Machine Consumable File(s):

http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers.xml

http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers.xmi

http://www.omg.org/spec/FIGI/20150501/PricingSources.xmi

http://www.omg.org/spec/FIGI/20150501/SecurityTypes.xmi

http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers.rdf

http://www.omg.org/spec/FIGI/20150501/PricingSources.rdf

http://www.omg.org/spec/FIGI/20150501/SecurityTypes.rdf

http://www.omg.org/spec/FIGI/20150501/AboutFIGI.rdf

http://www.omg.org/spec/FIGI/20150501/AboutFIGI-1.0.rdf

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Preface

OMG

Founded in 1989, the Object Management Group, Inc. (OMG) is an open membership, not-for-profit computer industry standards consortium that produces and maintains computer industry specifications for interoperable, portable, and reusable enterprise applications in distributed, heterogeneous environments. Membership includes Information Technology vendors, end users, government agencies, and academia.

OMG member companies write, adopt, and maintain its specifications following a mature, open process. OMG's specifications implement the Model Driven Architecture® (MDA®), maximizing ROI through a full-lifecycle approach to enterprise integration that covers multiple operating systems, programming languages, middleware and networking infrastructures, and software development environments. OMG's specifications include: UML® (Unified Modeling Language™); CORBA® (Common Object Request Broker Architecture); CWM™ (Common Warehouse Metamodel); and industry-specific standards for dozens of vertical markets.

More information on the OMG is available at http://www.omg.org/.

OMG Specifications

As noted, OMG specifications address middleware, modeling and vertical domain frameworks. All OMG Specifications are available from the OMG website at:

http://www.omg.org/spec

Specifications are organized by the following categories:

Business Modeling Specifications

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- **Specialized CORBA**

IDL/Language Mapping Specifications

Modeling and Metadata Specifications

- **UML, MOF, CWM, XMI**
- **UML Profile**

Modernization Specifications

Platform Independent Model (PIM), Platform Specific Model (PSM), Interface Specifications

- **CORBAServices**
- **CORBAFacilities**

OMG Domain Specifications

CORBA Embedded Intelligence Specifications

CORBA Security Specifications

Signal and Image Processing Specifications

All of OMG's formal specifications may be downloaded without charge from our website. (Products implementing OMG specifications are available from individual suppliers.) Copies of specifications, available in PostScript and PDF format, may be obtained from the Specifications Catalog cited above or by contacting the Object Management Group, Inc. at:

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Certain OMG specifications are also available as ISO standards. Please consult http://www.iso.org

Typographical Conventions

The type styles shown below are used in this document to distinguish programming statements from ordinary English. However, these conventions are not used in tables or headings where no distinction is necessary.

Times/Times New Roman - 10 pt.: Standard body text, table text, bullets

Helvetica/Arial – 9 or **10 pt. Bold:** OMG Interface Definition Language (OMG IDL) and syntax elements.

`Courier new/Courier – 10 pt. Bold`: Programming Languages

Helvetica/Arial – 10 pt.: Exceptions

Issues

The reader is encouraged to report any technical or editing issues/problems with this specification to *http://www.omg.org/report_issue.htm*.

1 Scope

1.1 Overview

The development of a Financial Instrument Global Identifier originated out of the recognition that chaos theory has nothing on the complexity generated everyday by the millions-perhaps billions-of security transactions that cross trading floors, clearinghouses, and exchanges all over the world. Almost every aspect of securities management is based on closed systems that use proprietary identifiers that are privately owned and licensed. Closing each deal is as much an exercise in translation as it is in transaction processing, as traders, investors, and brokers wrestle with multiple proprietary formats to determine what a security is, who owns it, how much it is worth, and when the deal should be closed. It introduces a tremendous amount of friction into the trade lifecycle and creates opaqueness where clarity is sought. In addition, the use of proprietary identifiers adds significant cost and overhead when users wish to integrate data from disparate sources or migrate to a different market data system.

The evolution of advanced symbologies has helped the securities industry grow, but the limitations and costs imposed by the closed systems have become more apparent as companies and institutions continue to integrate operations on a global scale. Proprietary symbology now stands as one of the most significant barriers to increased efficiency and innovation in an industry that sorely needs it. Moreover, the lack of common identifiers is a key roadblock to achieving the holy grail of straight-through processing (STP).

Points of Note:

- Licensing fees require firms to pay for each symbol system they use. International firms bear an especially heavy burden, because they often have to license several symbologies in order to manage trading operations in several countries.
- Restrictions imposed by proprietary symbologies prevent companies from easily mapping one set of codes to another. This hinders integration of market data from diverse sources as well as efforts to automate trade and settlement activities.
- Market data consumers who adopt proprietary symbols for use in their own systems must not only pay licensing fees, but such symbols also lead to significant future costs associated with efforts to connect to emerging trading systems.
- Proprietary trading environments may have worked well for years; but they are a byproduct of a time when data systems operated largely as islands that did not have to interoperate with other systems.

Current trends dictate a different approach. Markets, customers, and governments are demanding greater connectivity, transparency, and efficiency. What's more, the openness of Internet-based systems has profoundly altered the way businesses-and individuals-collect, manage, and share information. Thus, in addition to new regulations that demand clarity and accountability, the move to open symbology is being driven by growing investor and institutional demands.

Adopting an open system of shared symbology establishes the foundation for a tremendous leap forward in the efficient trade and settlement of securities as well as data management and reporting of financial instruments more generally. Such a system will allow firms and technology service providers to shift resources from laborious, inefficient processes to new investments in tools and products that will better serve clients.

An open system answers the call for greater transparency. Eliminating the need to remove proprietary IDs and re-map financial instruments will greatly simplify the steps needed to migrate between market data platforms and trading systems. Availability of a central symbology reference will facilitate mapping between users' internal systems and create opportunities for integration and automation of the global enterprise. This is to say that this standard represents a novel solution in the market that is not currently covered by other identifiers currently in circulation.

This specification lays out the details of the Financial Instrument Global Identifier across two dimensions:

1. The specification of the structure of the Global Identifier itself—what is/is not valid as a Global Identifier and how a Global Identifier is constructed and validated.

2. An ontological model specifying the relationship between the Global Identifier and other closely related information.

This specification has been created with the clear understanding that a published interface for creating identifiers and linking together relevant parties, e.g., Certified Providers or the Registration Authority, through the use of technology is a critical part of the operationalization of this standard. While high level descriptions of the various types of organizations that need to be involved as well as high level descriptions of the interactions between such organizations has been included in this document, they are included on the understanding that there will need to be a subsequent specification produced that details the necessary technical infrastructures and service level agreements for all participating organizations. To be clear, the technical specification of those services and service level agreements is out of scope for this document.

Global Identifier concepts are documented using two forms of definition:

1. A structured ontology specification of the concept, and its relationships to others, represented using the Web Ontology Language (OWL), in the form of (a) RDF/XML serialized OWL, (b) ODM (Ontology Definition Metamodel)-compliant ODM XMI, and (c) ODM-compliant UML XMI.

2. Natural language definitions which represent the concepts in natural language using the vocabulary of the finance industry.

3. Two controlled vocabularies in rdf format, one specifying the list of possible values for security types, one specifying the list of possible values for pricing sources. These lists are subject to growth over time as new security types are either invented or incorporated into FIGI and as new pricing sources are taken into account.

This specification covers both the content of the models, and the underlying architecture employed for producing and presenting the model.

This model is developed from a previously existing infrastructure that is currently active and had issued in excess of 150 million FIGI-compliant identifiers to date. The currently issued identifiers are freely available on a web site and through data files and are delivered upon request in bulk on a daily basis to interested parties. The purpose of this specification, however is to specify the structure of the Identifier itself and its relationship to key information elements rather than to specify the technology and related interfaces used to generate, access, and manage the identifiers.

2 Conformance

2.1 Introduction

An identifier is in conformance with this standard if, and only if, all of the following conditions are met:

Requirement	Description	Reference
Syntax of identifier.	The identifier shall be a twelve (12) character string as follows: Position 1: any upper case alphabetical character excluding vowels (but including “Y”). Position 2: any upper case alphabetical character excluding vowels (but including “Y”).. Position 3: the letter “G”. Positions 4-11: any alpha numeric character excluding vowels (but including “Y”).that, in combination with positions 1 and 2 does not constitute a duplicate of an existing string. Position 12: check digit (see section 7.1.2 for algorithm). Qualification: positions 1 and 2 cannot be the following sequences: BS, BM, GG, GB, VG.	Sub clause 6.2.1 Introduction
Uniqueness of identifier.	The identifier shall be a twelve character string, as specified above, that has never been assigned as a Financial Instrument Global Identifier.	Sub clause 6.2.1 Introduction
Composite Global Identifier	If a global identifier is to be designated as a Composite Global Identifier, it shall have at least one Global identifier associated with it.	Sub clause 6.2.1 Introduction
Share Class Global Identifier	If a global identifier is to be designated as a Share Class Global Identifier, it shall have at least one Composite Global identifier associated with it.	Sub clause 6.2.1 Introduction
Exchange Code	A global identifier will have either zero (0) or one (1) exchange code associated with it.	Sub clause 6.2.2 Exchange Code

Financial Instrument Name	Each global identifier will have at least one name, which need not be unique to the identifier.	Sub clause 6.2.3 Financial Instrument Name
Pricing Source	A global identifier will have any finite number of pricing sources, including zero (0) associated with it.	Sub clause 6.2.4 Pricing Source
Security Type	A global identifier will be associated with at least one (1) Security Type.	Sub clause 6.2.5 Security Type
Ticker	A global identifier will have at least one ticker associated with it. That ticker need not be unique to the identifier.	Sub clause 6.2.6 Ticker

There are no degrees of conformance.

2.2 Conformance as a Provider of Identifiers

2.2.1 Background & Approach

In order to support the accurate assignment of identifiers it is vital that a single financial instrument, appropriately understood, be identified by exactly one identifier. Further, it must be the case that a particular identifier, unless it is a composite or share class Identifier (see Clause 6 below), identifies exactly one financial instrument. In order to support this, then, it is necessary that when an Identifier is created two conditions are met:

- Uniqueness of Identifier: the twelve character string (see Clause 6 for details) is unique and has never been used at any time for a FIGI.
- Uniqueness of the Financial Instrument: the financial instrument being identified does not already have a FIGI associated with it.

In order to ensure that these two conditions are met there are two basic approaches that might be considered:

- one comprehensive system of record (perhaps with non-official copies embedded in other organizations) that can serve as the single point of reference against which to check Financial Instruments and Identifiers
- a consistently applied mechanism by which both Identifiers and Financial Instruments are partitioned and distributed amongst multiple systems.

The second approach is essentially the approach taken in support of the LEI effort. This approach has had its challenges, but one might argue that it is now stable and operating properly and that since it is a working system that is fully specified, we would do well to adopt that model for FIGI. While it is certainly the case that the multiple provider approach to generating LEIs is better now than it was at the outset, the system is still far from perfect. Again, the key factor in assigning an identifier, be it for LEI or FIGI, is to ensure that the identifier is unique and that the thing being identified is unique. In the former case, the system in place for LEI is working fine; by distributing unique identifier characteristics across multiple providers, the only possibility of a duplicate identifier is in a case where one provider reuses a string. While this is a possibility, it is not a real problem. In the latter case, this amounts to ensuring that the entity identified does not already have an identifier associated with it. This, however, is where the distributed approach used to support LEI continues to break down, albeit not a badly as it did when it was initially introduced. Duplicate

entities are being found on a weekly basis by one firm alone. The turn-around time to resolve these duplicates varies from hours to days. Again, while this is an improvement over the initial state of affairs, this is hardly an efficient model and clearly is sub-optimal in supporting near real-time markets.

The alternative model, leveraging a single system of record clearly solves this problem. By having a single system of record the possibility that two organizations can register the same entity is eliminated. Therefore, the single system of record approach is preferred. To that end, the following distinction needs to be made:

- Registration Authority (RA): the Registration authority serves as both an issuer of Identifiers and as a comprehensive system of record of the registered Identifiers.
    - The organization that will serve as the Registration Authority will be specified by the FDTF of the OMG.
- Certified Provider (CP): a Certified Provider (there can potentially be many) serves as an issuer of Identifiers and can elect to maintain a comprehensive inventory of Identifiers for their own purposes.
    - Each CP will elect an unused two consonant prefix to be used as the first two characters of the identifiers that they create.

The details of how two letter prefixes will be assigned is documented in Annex C. The details of how new Identifiers are created, either by a CP or through a request service is documented in Annex B.

2.2.2 Conformance

In order to conform to this specification, in addition to adhering to the technical requirements set out in Annex B, a Certified Provider will be required to:

- Specify only identifiers that are compliant with the technical specifications of the identifier as specified in Clause 6.
- Specify only identifiers that begin with the two letter prefix that is assigned to their organization as per the process outlined in Annex C.
- Take reasonable steps to ensure that each identifier they issue is unique within their assigned domain of possible identifiers.
- Provide an appropriate description of the financial instrument, which may vary according to the type of financial instrument, so as to provide the Registration Authority the ability to confirm the uniqueness of the instrument.

2.3 Conformance as a Consuming Application

A consuming application is in conformance with this standard provided that it is configured to ingest and store a syntactically correct Financial Instrument Global Identifier, a Composite Global Identifier, and a Share Class Global Identifier. Optionally, a consuming application may, but is not required to, ingest and store any or all of the remaining data points associated with an Identifier, e.g., the associated definition.

3 References

3.1 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

Reference	Description
[OWL 2]	OWL 2 Web Ontology Language Quick Reference Guide (Second Edition), W3C Recommendation 11 December 2012. Available at http://www.w3.org/TR/2012/REC-owl2-quick-reference-20121211/.
[RDF 1.1]	RDF 1.1 Concepts and Abstract Syntax, W3C Recommendation, 25 February 2014. Available at http://www.w3.org/TR/2014/REC-rdf11-concepts-20140225/
[RDF 1.1 Schema]	RDF Schema 1.1. W3C Recommendation, 25 February 2014. Available at http://www.w3.org/TR/2014/REC-rdf-schema-20140225/.
[SKOS]	SKOS Simple Knowledge Organization System Reference, W3C Recommendation 18 August 2009. Available at http://www.w3.org/TR/2009/REC-skos-reference-20090818/.
[W3C Datatypes in RDF and OWL]	XML Schema Datatypes in RDF and OWL, W3C Working Group Note 14 March 2006, Available at http://www.w3.org/TR/2006/NOTE-swbp-xsch-datatypes-20060314/.
[XML Schema Datatypes]	W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes. W3C Recommendation, 5 April 2012. Available at http://www.w3.org/TR/xmlschema11-2/.
[Dublin Core]	DCMI Metadata Terms, Issued 2013-06-14 by the Dublin Core Metadata Initiative. Available at http://www.dublincore.org/documents/dcmi-terms/.
[MOF]	Meta Object Facility (MOF™) Core, v2.4.1. OMG Available Specification, for-mal/2011-08-07. Available at http://www.omg.org/spec/MOF/2.4.1/.
[MOF XMI]	MOF 2/XMI (XML Metadata Interchange) Mapping Specification, v2.4.1. OMG Available Specification, formal/2011-08-09. Available at http://www.omg.org/spec/XMI/2.4.1/.
[ODM 1.1]	Ontology Definition Metamodel (ODM), Version 1.1, Available at http://www.omg.org/spec/ODM/1.1/.
[OMG AB Specification Metadata]	OMG Architecture Board recommendations for specification of ontology metadata, Available at http://www.omg.org/techprocess/ab/SpecificationMetadata.rdf.
[UML2]	Unified Modeling Language™ (UML®), version 2.4.1. OMG Specification, formal/2011-08-06. Available at http://www.omg.org/spec/UML/2.4.1/.

4 Terms and Definitions

4.1 Specific Terminology

The human readable definitions have been constructed by and with the input of business subject matter experts. In cases where there are FIBO definitions available either the FIBO definitions were used or they were incorporated into the formal definitions.

For the purposes of this specification, the following terms and definitions apply.

Ontology

Definition: A formalization of a conceptualization. For the purposes of this specification the formalization is in OWL and the conceptualization is that of business subject matter specific to the identification of financial instruments.

Taxonomy

Definition: A set of terms which stand in some classification relation to one another.

Vocabulary

Definition: A set of words, each giving one or more formal definitions which apply to a meaningful concept that is referred to by that word.

4.2 Financial Terms

Financial Instrument

Definition: Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.

4.3 Identifier

In general terms, an Identifier can be understood as follows:

> An identifier is a name that identifies (that is, labels the identity of) either a unique object or a unique class of objects, where the "object" or class may be an idea, physical [countable] object (or class thereof), or physical [noncountable] substance (or class thereof). The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). An identifier may be a word, number, letter, symbol, or any combination of those.
>
> The words, numbers, letters, or symbols may follow an encoding system (wherein letters, digits, words, or symbols stand for(represent) ideas or longer names) or they may simply be arbitrary. When an identifier follows an encoding system, it is often referred to as a code or ID code. Identifiers that do not follow any encoding scheme are often said to be arbitrary IDs; they are arbitrarily assigned and have no greater meaning. (Sometimes identifiers are called "codes" even when they are actually arbitrary, whether because the speaker believes that they have deeper meaning or simply because he is speaking casually and imprecisely.)

The above definition is general and applies to a range of items in this specification including Financial Instrument Names and Financial Instrument Identifiers. A more precise definition is, however, called for with respect to Financial Instrument Global Identifiers.

For the purposes of this specification an identifier when applied to the FIGI is understood as:

Definition:	A unique string of characters which is semantically meaningless, but adheres to specific syntax restrictions.

Unpacking this:

Unique:

Definition:	An item is unique if, and only if, within its domain, understood in this contect to include all and only FIGIs, it does not duplicate any other item either currently or historically specified as an identifier within the domain where “duplicate” means consisting of exactly the same twelve characters in exactly the same order.

Uniqueness does not apply across domains. That is to say, that there is no guarantee that a given string may not be used as an Identifier outside of FIGI. That said, considerable effort was employed to reduce the chances that a given Identifier would not be a duplicate of another Identifier within the financial domain.

To say that the identifier is semantically meaningless is to say that, beyond syntax restrictions, the assignment of characters to given positions within the twelve character string is entirely without semantic content. The only exceptions to this clause are slight restrictions to which two letters can occupy the first two positions, the letter that shall occupy the third position, and the value of the last character, which is a calculated, though still meaningless, check digit.

5 Symbols and Abbreviations

5.1 Symbols

There are no symbols introduced by this specification.

5.2 Abbreviations

The following abbreviations are used throughout this specification:

- FIBO – Financial Industry Business Ontology
- FIGI – Financial Instrument Global Identifier
- ISIN – International Securities Identification Number
- LEI – Legal Entity Identifier
- ODM – Ontology Definition Metamodel
- OWL – Web Ontology Language
- RDF – Resource Definition Framework
- SME – Subject Matter Expert
- UML – Unified Modeling Language
- URL – Uniform Resource Locator
- XMI – XML Metadata Interchange
- XML – eXtensible Markup Language

Additional symbols and abbreviations that are used only in annexes to this specification are given in those annexes.

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6 Architecture

6.1 Global Identifier Structure

6.1.1 Introduction

A Financial Instrument Global Identifier is structured as a twelve (12) character string which is semantically meaningless. As the string is intended to remain attached to a given financial instrument throughout the life of that instrument in addition to serving as a historical reference for retired/obsolete financial instruments, it is vital that the string be structured in such a way as to be semantically neutral.

Owing to the granularity of the Financial Instrument Identifier, there is a need for multiple types of identifiers so as to provide groupings of Financial Instruments. The three types of Financial Instrument Global Identifiers are as follows:

- Global Identifier: this is the most basic type of identifier that applies to exactly and only one Financial Instrument at the most granular level. For example, AAPL common stock as traded on NASDAQ Global Select. The granularity of this identifier is found in that which it identifies. In particular, the most basic FIGI identifies a financial instrument, where applicable, at the trading venue level. That is, where applicable, the Global Identifier identifies a Financial Instrument within the context of an exchange venue.

- Composite Global Identifier: The Composite Global Identifier is itself a Global Identifier which is differentiated from a "normal" Global Identifier in that it serves as a parent in a hierarchy of individual Global Identifiers. For example, AAPL common stock, US Composite. The purpose of this "version" of the identifier is to group individual identifiers, as per above, into groupings at the country level. This is not, however, merely a grouping of financial instruments. Rather, a Composite Global Identifier identifies a unique financial instrument within the context of a country.

  The Composite Global Identifier only applies to a limited subset of Global Identifiers. In particular, it only applies to those Global Identifiers that can be differentiated based on either the exchange on which the asset is traded or on the pricing source of the asset. These conditions only obtain in the case of Equities. As such, the Composite Global Identifier is only used in grouping equities.

- Share Class Global Identifier: The Share Class Global Identifier is itself a Global Identifier which is differentiated from a "normal" Global Identifier and a Composite Global Identifier in that it serves as a parent in a hierarchy of individual Composite Global Identifiers. For example, AAPL common stock as traded across the planet presented as a list of Composite Global Identifiers. Similar to a Composite Global Identifier, the Share Class Global Identifier identifies a financial instrument within the context of the global perspective, e.g., aapl common stock.

  Like the Composite Global Identifier, the Share Class Global Identifier only applies to a limited subset of Global Identifiers. As a grouping mechanism for Composite Global Identifiers, the Share Class Global Identifier is only used in grouping equities.

All three types of Financial Instrument Identifiers have exactly the same structure and syntax restrictions as specified below.

6.1.2 Syntax

The permissible characters for use within a FIGI are a subset of ISO 8859-1 as follows:

- All upper case ISO 8859-1 consonants (including Y).
  - The exact list of permissible letters is B,C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z
- The single digit integers 0 – 9.

While the string itself is semantically meaningless, there is a specific structure that is used. The syntax rules for the twelve characters are as follows:

- Characters 1 and 2:
    - Any combination of upper case consonants with the following exceptions:

  BS, BM, GG, GB, GH, KY, VG The purpose of the restriction is to reduce the chances that the resulting identifier may be identical to an ISIN string. (Strictly speaking, a duplicate is not a problem as the strings designate different things, but care has been taken to reduce ambiguity.) The way that ISIN is constructed is that the first two characters correspond to the country of issuance. The third character, depending on the issuing organization is typically a numeral. However, in the case of the United Kingdom, the letter "G" is assigned. As we are using the letter "G" as our third character (see below), the only combinations that may come up within ISIN that only incorporates consonants are BSG (Bahamas), BMG (Bermuda), GGG (Guernsey), GBG (United Kingdom) and VGG (British Virgin Islands). The reason for this is that the United Kingdom issues ISIN numbers for entities within its broader jurisdiction.

  The allocation of the prefixes for different Certified Providers (CPs) is specified in Annex C.

- Character 3:
    - The upper case letter G (for "global")
- Characters 4 – 11:
    - Any combination of upper case consonants and the numerals 0 – 9
- Character 12:
    - A check digit (0 – 9) which is calculated as follows:
        - Letters are converted to integers as illustrated below. Using the first 11 characters and beginning at the last character in integer format and working right to left, every second integer is multiplied by two. The resulting string of integers (numbers greater than 10 become two separate digits) are added up. Subtract the total from the next higher integer ending in zero. If the total obtained when summing up the digits is a integer ending in zero, then the check digit is zero.

          Alphabetical characters are assigned a numeric value according to the following table:

B = 11	F = 15	J = 19	M = 22	Q = 26	T = 29	X = 33
C = 12	G = 16	K = 20	N = 23	R = 27	V = 31	Y = 34
D = 13	H = 17	L = 21	P = 25	S = 28	W = 32	Z = 35

For example, for the string BBG000BLNQ1 the calculation of the check digit would be as follows:

B	B	G	0	0	0	B	L	N	Q	1	
11	11	16	0	0	0	11	21	23	26	1	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
11	22	16	0	0	0	11	42	23	52	1	the resulting values after multiplying in above step

Add up the resulting values above :

1+1+2+2+1+6+0+0+0+1+1+4+2+2+3+5+2+1 = 34

Check digit 6

40 the next highest integer ending in zero

The string with check digit would be BBG000BLNQ16

Similarly:

N	R	G	9	2	C	8	4	S	B	3	
23	27	16	9	2	12	8	4	28	11	3	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
23	54	16	18	2	24	8	8	28	22	3	the resulting values after multiplying in above step

Add up the resulting values above :

2+3+5+4+1+6+1+8+2+2+4+8+8+2+8+2+2+3 = 71

Check digit 9

80 the next highest integer ending in zero

The string with check digit would be NRG92C84SB39.

The provenance of the check digit is the familiar Modulus 10 algorithm developed initially by Hans Peter Luhn and described in U.S. Patent No. 2,950,048 and part of the public domain. A familiar instantiation of this algorithm is specified in ISO 6166 and is used in generating the check digit for ISIN identifiers. In this instance, a few elements of the “standard” Modulus 10 algorithm have been adjusted so as to result in a different check digit than would be present in other similarly structured identifiers, e.g., ISIN. In particular, rather than multiplying the integer value corresponding to every second character starting with the second character in the identifier by two, as is the case with this specification, the ISIN specification begins with the first character. The result is that the check digit is different in over 90% of the logically possible strings.

6.2 Global Identifier Associated Content

6.2.1 Introduction

While the Global Identifier is at the heart of this specification, it does not exist in a vacuum. Rather, a set of complementary fields are associated with the Identifier, two of which are special instances of the identifier itself. The need for the additional data points is largely a function of the granularity of the Global Identifier. Since the Global Identifier serves to identify financial instruments at the most granular possible level, it is very helpful to clearly specify the differentiators that constitute the granularly. To that end, a number of key data elements are associated with each Global Identifier that serve to highlight the differentiating features as well as provide additional information about the financial instrument, e.g., its name.

The following sub clauses outline the various data elements associated with the Global Identifier. The relationships between the various types are explicated in later sub clauses.

6.2.2 Exchange Code

Financial instruments are, by their nature, things which can be bought or sold. The financial instruments to which this standard speaks are bought or sold on an individual exchange. Since the Global Identifier assigns unique identifiers to financial instruments at the most granular level possible, specifying the exchange on which the individual financial instrument is traded is valuable. It is grouped, along with Pricing Source, as an associated Code. Exchange codes are associated with Financial Instruments through the “has” object property. (“has” is used rather than a more descriptive object property such as “hasAssociatedCode” in order to leverage reasoning facilities and be “mappable” to FIBO relations.)

6.2.3 Financial Instrument Name

Financial Instrument Name is the name of the company, and sometimes including a brief description of the security. The name of an instrument may change in conjunction with corporate actions. As noted above, the Identifier associated with the instrument will not change in response to such an event. In many cases, e.g., common stock, the Financial Instrument Name also happens to be the name of the issuing body. This is not sufficient to individuate the financial instrument, however, as organizations issue financial instruments with exactly the same name but that trade on different exchanges. This is a distinction that is absent in other identifiers, but serves as an individuating characteristic for FIGI.

As it is the identifier that serves as the source of persistence through change, any changes in names are simply that, changes in names. The FIGI itself, which does not change, simply has the value of the Financial Instrument Name class change for a particular individual. Historical names are not part of the FIGI standard, though there is nothing precluding any organization from capturing and storing historical FIGI data for their own needs including, but not limited to, the Financial Instrument Name.

6.2.4 Pricing Source

The pricing source for a financial instrument is the organization or company that supplies the pricing data for the particular vehicle within the particular market, e.g., on a given exchange. It is grouped, along with Exchange Code, as an associated code. A set of individuals that are members of the class “PricingSource” are specified in an associated ontology included as part of this specification.

6.2.5 Security Type

A security type is a specific category of a financial instrument that further clarifies the nature of the instrument. For example, an Equity might be an American Depository Receipt as opposed to a Common Stock. The list of Security types is dynamic and should be expected to change over time. A set of individuals that are members of the class “SecurityType” are specified in an associated ontology included as part of this specification.

6.2.6 Ticker

A ticker is a specific identifier for a financial instrument that reflects common usage. Tickers are not, however, unique to specific exchanges or specific pricing sources. Rather, a given ticker might be associated with multiple Global Identifiers, e.g., an October 13 Put on AAPL US (Name) might have a ticker value of AAPL10/19/13 P210 yet be associated with multiple Global Identifiers owing to the diversity of exchanges on which the asset can be traded.

6.3 Relationships Among Elements

As outlined above, there are multiple information elements that are associated with a given Global Identifier. These serve to provide either context for the financial instrument or a user-friendly reference. In order to serve in these functions, however, the various classes need to stand in specific relationships with the Global Identifier. The exact natures of the relationships are specified in the associated OWL file; below is the description of those relationships. Detailed UML diagrams specifying these relationships are presented below in Clause 8. The current descriptions are intended for a business audience that may be more comfortable with explanations rather than technical diagrams.

6.3.1 Global Identifier

At the heart of this model are two things: a financial instrument and a global identifier. The Global Identifier itself is part of group of three different types of financial instrument identifiers. As such, the Global Identifier stands in relationships to both Financial Instruments and to the other identifiers.

- Relationship to Financial Instruments:
    - A Global Identifier identifies exactly one Financial Instrument.
    - A Financial Instrument is identified by exactly one Financial Instrument Identifier (the parent class of the Global Identifier).
- Relationship to other Financial Instrument Identifiers
    - A Global Identifier may have up to, but not exceeding, one Composite Global Identifier as a parent.

6.3.2 Composite Global Identifier

As noted above, a Composite Global Identifier is, essentially, a grouping of more granular Global Identifiers. The key differentiator is that a Composite Global Identifier has at least one "child" global identifier. As such the relationship between a Global Identifier and a Composite Global identifier is:

- Relationship to other Financial Instrument Identifiers
    - A Composite Global Identifier shall have at least one Global identifier as a child.
    - A Composite Global Identifier may have up to, but not exceeding, one Share Class Global Identifier as a parent.

6.3.3 Share Class Global Identifier

The relationship between a Composite Global Identifier and a Share Class Global Identifier is as follows:

- Relationship to other Financial Instrument Identifiers
    - A Share Class Global Identifier shall have at least one Composite Global Identifier as a child.

A visual summary of sub clauses 6.3.1 – 6.3.3 is presented below in Figure 6.1.

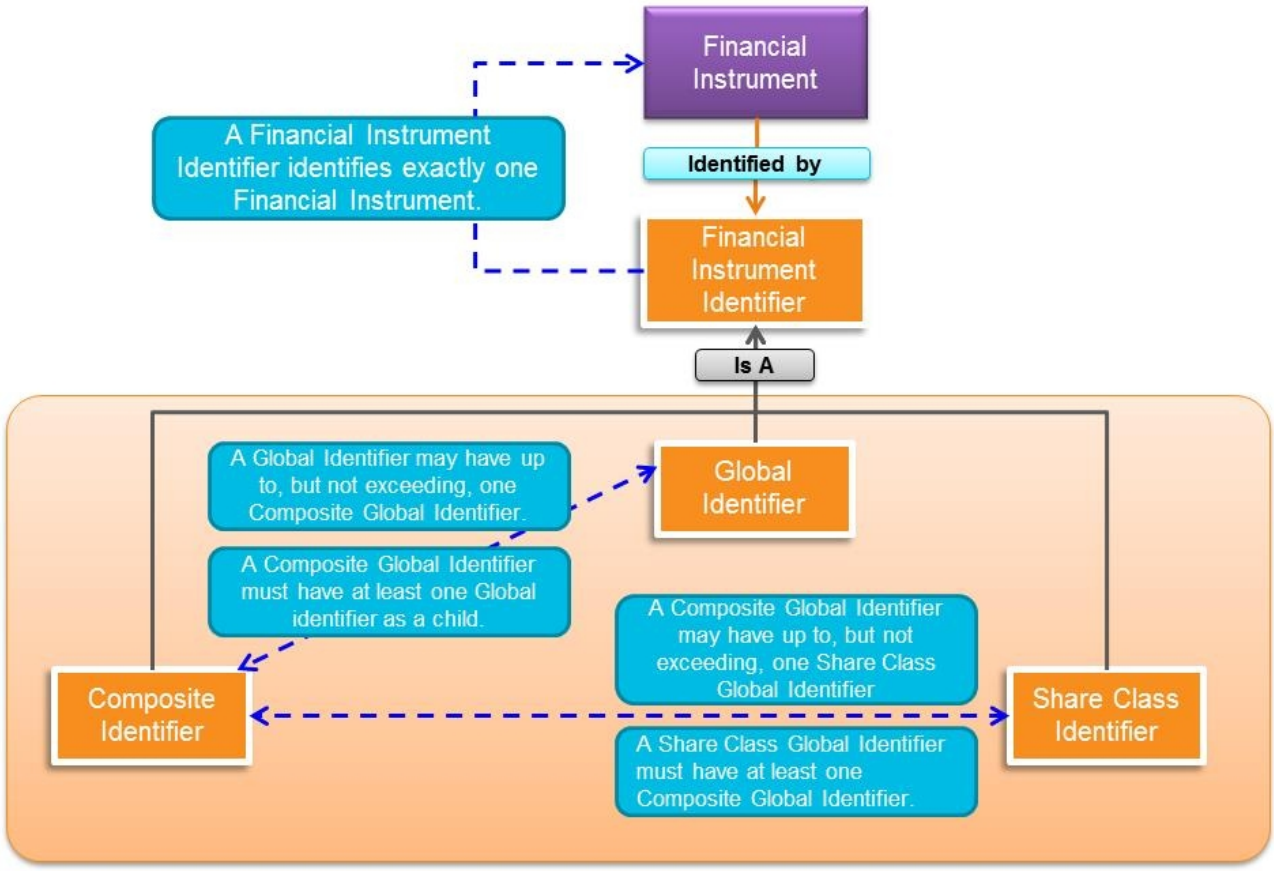

Figure 6.1 - Identifier Types

6.3.4 Exchange Code

The relationship between a Financial Instrument and an Exchange Code is as follows:

- A Financial Instrument may have up to, but not exceeding, one Exchange Code.
    - Note: the vast majority of Financial Instruments have, as a matter of practice, one Exchange Code.

6.3.5 Financial Instrument Name

The relationship between a Financial Instrument and a Financial Instrument Name is as follows:

- A Financial Instrument is identified by at least one Financial Instrument Name.

Multiple Financial Instruments can be associated with a single name as there is no requirement that the name of a Financial Instrument specify all of the individuating characteristics of a Financial Instrument, e.g., the pricing source. There is, however, nothing precluding such specificity either.

6.3.6 Pricing Source

The relationship between a Financial Instrument and a Pricing Source is as follows:

- A Financial Instrument may have any number of Pricing Sources, including zero.

As a matter of practice, almost all Financial Instruments have an associated Pricing Source, but there are cases, e.g., some corporate bonds, where this is not the case.

6.3.7 Security Type

The relationship between a Financial Instrument and a Security Type is as follows:

- A Financial Instrument is classified by at least one Security Type.

6.3.8 Ticker

The relationship between a Financial Instrument and a Ticker is as follows:

- A Financial Instrument is identified by at least one Ticker.

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7 Controlled Vocabularies

7.1 Introduction

In addition to the basic classes outlined above, there are two sets of named individuals that serve as controlled vocabularies for the classes. While the vocabularies described below and included as a part of the specification are current as of the writing of this document, they are subject to change, through growth, over time.

The process by which the controlled vocabularies changes is directly related to the activities of both the Registration Authority and the Certified Providers (see Annex B).

7.2 Security Types

As specified above, each Global Identifier has at least one Security Type associated with it. The Security Types are specified in the associated SecurityTypes rdf vocabulary.

Over time, the set of available security types is subject to change. Two events can trigger such a change:

- New security types are invented.

  The financial sector is dynamic and new financial instruments are constantly being created. Some are simply variations on existing instruments, e.g., a new mutual fund, but some are genuinely novel. Given the granularity of the security types currently inventoried in this controlled vocabulary (375 unique named individuals), it is likely that new financial instruments will emerge that require a new label.

- The coverage of FIGI expands.

  Currently FIGI covers over 190 million financial instruments. A large number to be sure, but given the granularity of FIGI, e.g., differentiating between AAPL being traded on one exchange as opposed to another, this list is certainly incomplete. Over time, additional financial instruments that simply are not covered at present will be incorporated into FIGI at which point the security type list will need to be expanded.

7.3 Pricing Sources

Like Security Types, there is a known set of individuals that can be used to specify the Pricing Source, as defined in PricingSources.rdf. The pricing sources, while not applicable to all financial instruments, specify the organization that has issued the pricing data for a particular Financial Instrument. Frequently, the organization is a financial services organization such as a Bank. As the pricing source is one of the elements that can serve to differentiate one Financial Instrument from another for the purposes of FIGI, it is vital that this information is specified. However, the potential list of pricing sources is subject to grow over time as new organizations enter the business space.

Note, because FIGI also applies to historical data and “retired” financial instruments, there will be no instances where pricing sources specified will drop off of the list.

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8 FIGI Ontology

8.1 Ontology Architecture and Namespaces

The ontology architecture for FIGI is designed to facilitate ontology extension, evolution, mapping, and reuse to the degree possible. It depends on (1) basic terminology and ontology metadata, such as the OMG Architecture Board's Specification Metadata recommendation, and (2) may ultimately be mapped to other ontologies such as parts of the Financial Industry Business Ontology (FIBO). The FIGI specification includes two subordinate vocabularies:

- SecurityTypes rdf, which contains all of the named individuals for security types as of the date of publication, and
- PricingSources.rdf, which contains all of the named individuals for pricing sources as of the date of publication.

The namespaces and their well-known prefixes corresponding to external elements required for use of the FIGI Global Instrument Identifier ontology consist of of those listed in Table 8.1, below.

Table 8.1 - Prefix and Namespaces for referenced/external vocabularies

Namespace Prefix	Namespace
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
rdfs	http://www.w3.org/2000/01/rdf-schema#
owl	http://www.w3.org/2002/07/owl#
xsd	http://www.w3.org/2001/XMLSchema#
dct	http://purl.org/dc/terms/
skos	http://www.w3.org/2004/02/skos/core#
sm	http://www.omg.org/techprocess/ab/SpecificationMetadata/

The namespace approach taken for FIGI is based on OMG guidelines and is constructed as follows:

- A standard OMG prefix, http://www.omg.org/spec/
- The abbreviation for the specification: FIGI
- The ontology or vocabulary name: GlobalInstrumentIdentifiers, SecurityTypes, and PricingSources

Note that the URI/IRI strategy for the ontology and two related vocabularies takes a "slash" rather than "hash" approach, in order to accommodate server-side applications. Though not technically necessary, this specification does mandate namespace prefixes to be used. These are constructed as follows with the components separate by "-":

- The specification abbreviation: figi
- The ontology or vocabulary abbreviation: gii, st, and ps, respectively.

The namespace itself for this specification is: http://www.omg.org/spec/FIGI/GlobalInstrumentIdentifiers/, and corresponding namespace prefix is figi-gii. The version IRI for the specification is http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers/.

The namespaces for the subordinate vocabularies are:

- http://www.omg.org/spec/FIGI/SecurityTypes/
- http://www.omg.org/spec/FIGI/PricingSources/

and their corresponding version IRIs are:

- http://www.omg.org/spec/FIGI/20150501/SecurityTypes/
- http://www.omg.org/spec/FIGI/20150501/PricingSources/.

8.2 Global Instrument Identifiers Ontology

8.2.1 Ontology Metadata

The FIGI ontologies include metadata that conforms with the Specification Metadata recommendation from the OMG architecture board. The tables that follow provide the annotation property names and their values for metadata specified at the ontology level.

8.2.1.1 Specification-Level Metadata

The annotations provided in Table 8.2 include metadata common to the GlobalInstrumentIdentifiers ontology, SecurityTypes, and PricingSources vocabularies. In every instance, the metadata is specified in the informative about files rather than in each ontology file.

Table 8.2 - Specification Level and Version Metadata

Metadata Term	Value
sm:specificationTitle	Financial Instrument Global Instrument Identifier (FIGI) Specification or Financial Instrument Global Identifier (FIGI) Specification Version 1.0
sm:specificationAbbreviation	FIGI
sm:specificationURL	http://www.omg.org/spec/FIGI/ or http://www.omg.org/spec/FIGI/1.0/
sm:specificationAbstract	A Financial Instrument Global Identifier (FIGI) is a unique, persistent twelve character string that serves to identify financial instruments. Along with the identifier, a number of related data points are identified and defined so as to provide clear context and differentiation of the financial instruments specified by the identifiers. The machine consumable OWL file associated with FIGI defines all of the classes that constitute an identifier as well as the relationships between those classes so as to provide a comprehensive semantic model for Financial Instrument Global Identifiers.
sm:dependsOn	http://www.omg.org/techprocess/ab/SpecificationMetadata/

Metadata Term	Value
sm:thisVersion	1.0
sm:publicationDate	2014-02-24T18:00:00
sm:specificationVersionURL	http://www.omg.org/spec/FIGI/ or http://www.omg.org/spec/FIGI/1.0
sm:specificationVersionStatus	Formal Specification
skos:historyNote	Revisions to the FIGI specification are managed per the process outlined in the Policies and Procedures for OMG standards, with the intent to maintain backwards compatibility in the ontologies to the degree possible. The RDF/XML serialized OWL for the Foundations ODM/OWL ontologies have been checked for syntactic errors and logical consistency with Protege 4 (http://protege.stanford.edu/) and HermiT 1.3.8 (http://www.hermit-reasoner.com/), Pellet 2.2 (http://clarkparsia.com/pellet/) and RacerPro reasoners for OWL 2 ontologies. Note that Pellet 2.2 cannot process the regex string pattern in the data restriction, however. Users who wish to use Pellet due to other advantages should comment out the restriction on the hasUniqueTextIdentifier property in the definition of FinancialInstrumentIdentifier.
sm:addressForComments	http://www.omg.org/issues/
sm:copyright	Copyright (c) 2013-2015, Bloomberg LP Copyright (c) 2015, Object Management Group, Inc.
sm:submitter	Bloomberg LP
sm:contributor	Adaptive, Inc., Thematix Partners LLC
dct:license	The MIT License: Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Metadata Term	Value
dct:license	http://opensource.org/licenses/mit-license.php
sm:responsibleTaskForce	http://fdtf.omg.org/

8.2.1.2 Ontology-Level Metadata

The annotations provided in Table 8.3 include metadata specific to the GlobalInstrumentIdentifiers ontology.

Table 8.3 - Ontology-level Annotations for FIGI

Metadata Term	Value
sm:filename	Global Instrument Identifiers Ontology
sm:fileAbbreviation	figi-gii
OntologyIRI	http://www.omg.org/spec/FIGI/GlobalInstrumentIdentifiers/
owl:versionIRI	http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers/
sm:contentLanguage	http://www.omg.org/spec/ODM/ http://www.w3.org/standards/techs/owl#w3c_all

8.2.2 Top-Level Class Hierarchy

In addition to this specification, FIGI is provided as an ODM/OWL 2 compliant ontology with two supporting OWL 2 vocabularies. The ontology is defined using the ODM 1.1 stereotypes for RDF and OWL, and is explained via UML diagrams and corresponding tables describing the relevant model elements (the source for which is included as part of this specification in separate machine-readable files).

Each of the classes specified here are direct reflections of the concepts defined in 6.1 and 6.2 with the single exception of Financial Instrument which is defined as follows:

> Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.

A clarification of this (which is represented as a “note” in the associated model files) is as follows:

> Financial instruments can be categorized by form depending on whether they are cash instruments or derivative instruments:
>
> > Cash instruments are financial instruments whose value is determined directly by markets. They can be divided into securities, which are readily transferable, and other cash instruments such as loans and deposits, where both borrower and lender have to agree on a transfer.
> >
> > Derivative instruments are financial instruments which derive their value from the value and characteristics of one or more underlying assets. They can be divided into exchange-traded derivatives and over-the-counter (OTC) derivatives.

Alternatively, financial instruments can be categorized by "asset class" depending on whether they are equity based (reflecting ownership of the issuing entity) or debt based (reflecting a loan the investor has made to the issuing entity). If it is debt, it can be further categorized into short term (less than one year) or long term.

Foreign Exchange instruments and transactions are neither debt nor equity based and belong in their own category.

The grouping of Financial Instrument Identifier along with Financial Instrument Name and Ticker into a broader class named Identifier is a reflection of the fact that all three classes contain as individuals things which serve to identify, perhaps not uniquely in some cases, other things, in this case, financial instruments. Figure 8.1 provides the top-level class hierarchy for the model.

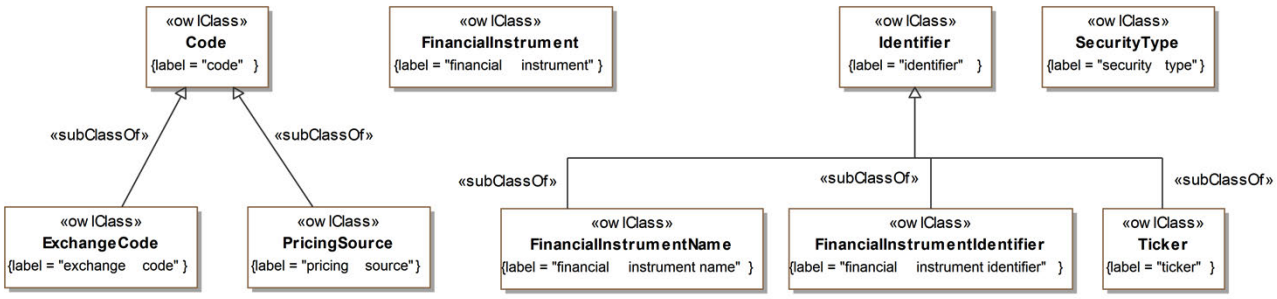

Figure 8.1 - Top-Level Class Hierarchy

Property definitions for all properties in the FIGI ontology are given in Table 8.4.

Table 8.4 - Property Definitions for the FIGI Ontology

Property Name	Type	Label	Definition	Definition Source	Domain	Range
classifies	object property	classifies	arranges in classes; assigns to a category	Merriam-Webster Dictionary	owl:Thing	owl:Thing
has	object property	has	indicates that someone (or something) possesses something, as a characteristic, attribute, feature, capability, and so forth		owl:Thing	owl:Thing
identifies	object property, functional property	identifies	relates an identifier to the entity that it identifies		owl:Thing	owl:Thing
IsClassified By	object property, irreflexive property	is classified by	indicates the category or classifier used to classify an entity		owl:Thing	owl:Thing

IsIdentified By	object property	is identified by	relates an entity to an identifier or key that identifies it		owl:Thing	owl:Thing
HasUnique TextIdentifier	data property	has unique text identifier	links an entity to a unique identifier for that entity; may be associated with anything. With reference to a given (possibly implicit) set of objects, a unique identifier (UID) is any identifier which is guaranteed to be unique among all identifiers used for those objects and for a specific purpose.	https://en.wikipedia.org/wiki/Unique_identifier	owl:Thing	xsd:string

8.2.3 Financial Instruments

As noted in sub clause 6.3, Financial Instruments, which are at the heart of this specification, stand in a number of relationships to the other classes and subclasses defined in the model. Figure 8.2 depicts these relationships in detail.

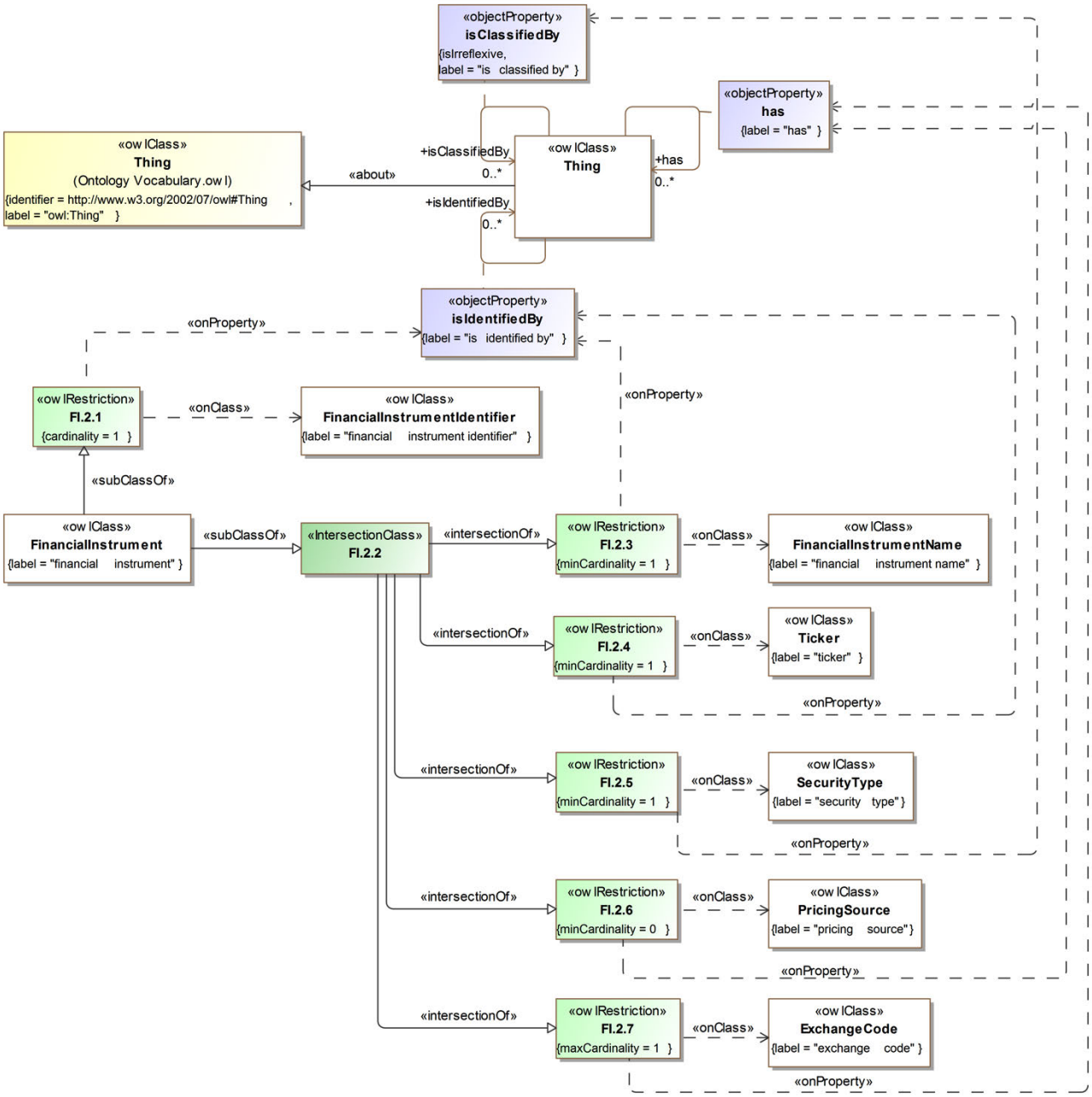

Figure 8.2 - Financial Instruments

Of note in the above diagram, we can see that Financial Instruments participate in three types of relationships:

- 'has': indicates that someone (or something) possesses a property such as a characteristic, attribute, feature, capability, and so forth.
- 'is classified by': indicates the category is used to classify an entity, in this case, a financial instrument.
- 'is identified by': relates an entity, in this case a financial instrument, to an label of some sort that serves as a reference to it (perhaps not uniquely).

The diagram illustrates the following, again as outlined in 6.3.3:

- 'has' applies to:

  - financial instrument exchange code (FI.2.7)
  - financial instrument → pricing source (FI.2.6)
- 'is classified by' applies to:
  - financial instrument → security type (FI.2.5)
- 'is identified by' applies to:
  - financial instrument → financial instrument name (FI.2.3)
  - financial instrument → ticker (FI.2.4)
  - financial instrument → financial instrument identifier (FI.2.1)

Class expression definitions for all expressions depicted in Figure 8.2, above, are given in Table 8.5.

Table 8.5 - Class Expression Definitions for Financial Instruments

Class Expression	Type	Label	Definition	Parent
ExchangeCode	class	exchange code	a code for the exchange on which the security trades	Code
FinancialInstrument	class	financial instrument	Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.	F.2.1, F.2.2
FinancialInstrumentIdentifier	class	financial instrument identifier	A financial instrument identifier is an identifier that identifies (that is, labels the identity of) a financial instrument with a unique, persistent, semantically meaningless ID. The abbreviation 'ID' often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). A financial instrument identifier consists of a 12 digit alpha-numeric, randomly generated ID covering active and inactive securities. In total there will be more than 852 billion potential combinations available. The first 3 characters begin with 'xxG'; where 'x' can be any upper-case consonant or 'Y' (with certain restrictions), positions 4-11 are alpha-numeric (excluding vowels) and the last digit is a check digit, which is calculated based on a variation of the Modulus 10 Double Add Double Formula.	Identifier, I.3.2, I.3.3 (equivalence)

FinancialInstrumentName	class	financial instrument name	the English language name of the company or the financial instrument, e.g., a particular fund name. It sometimes includes a brief description of the security or a differentiating feature, e.g., the issuance date. The name of an instrument may change in conjunction with corporate actions.	Identifier
<blank node>	restriction	FI.2.1	isIdentifiedBy exactly 1 FinancialInstrumentIdentifier	
<blank node>	intersection	FI.2.2	intersection of F.2.3, F.2.4, F.2.5, F.2.6, and F.2.7.	
<blank node>	restriction	FI.2.3	isIdentifiedBy min 1 FinancialInstrumentName	
<blank node>	restriction	FI.2.4	isIdentifiedBy min 1 Ticker	
<blank node>	restriction	FI.2.7	isClassifiedBy min 1 SecurityType	
<blank node>	restriction	FI.2.8	has min 0 PricingSource	
<blank node>	restriction	FI.2.9	has max 1 ExchangeCode	
PricingSource	class	pricing source	The pricing source for a security.	Code
SecurityType	class	security type	The type of security, for example, common stock.	ST.5.1, ST.5.2
Ticker	class	ticker	The assigned ticker. The rules for forming the ticker vary according to security class.	Identifier

8.2.4 Identifiers

Figure 8.3 specifies the ontological relationships between the three varieties of Financial Instrument Identifiers as well as their relationship to Financial Instruments. In every case, the relationships are as specified in 6.3.1 – 6.3.3.

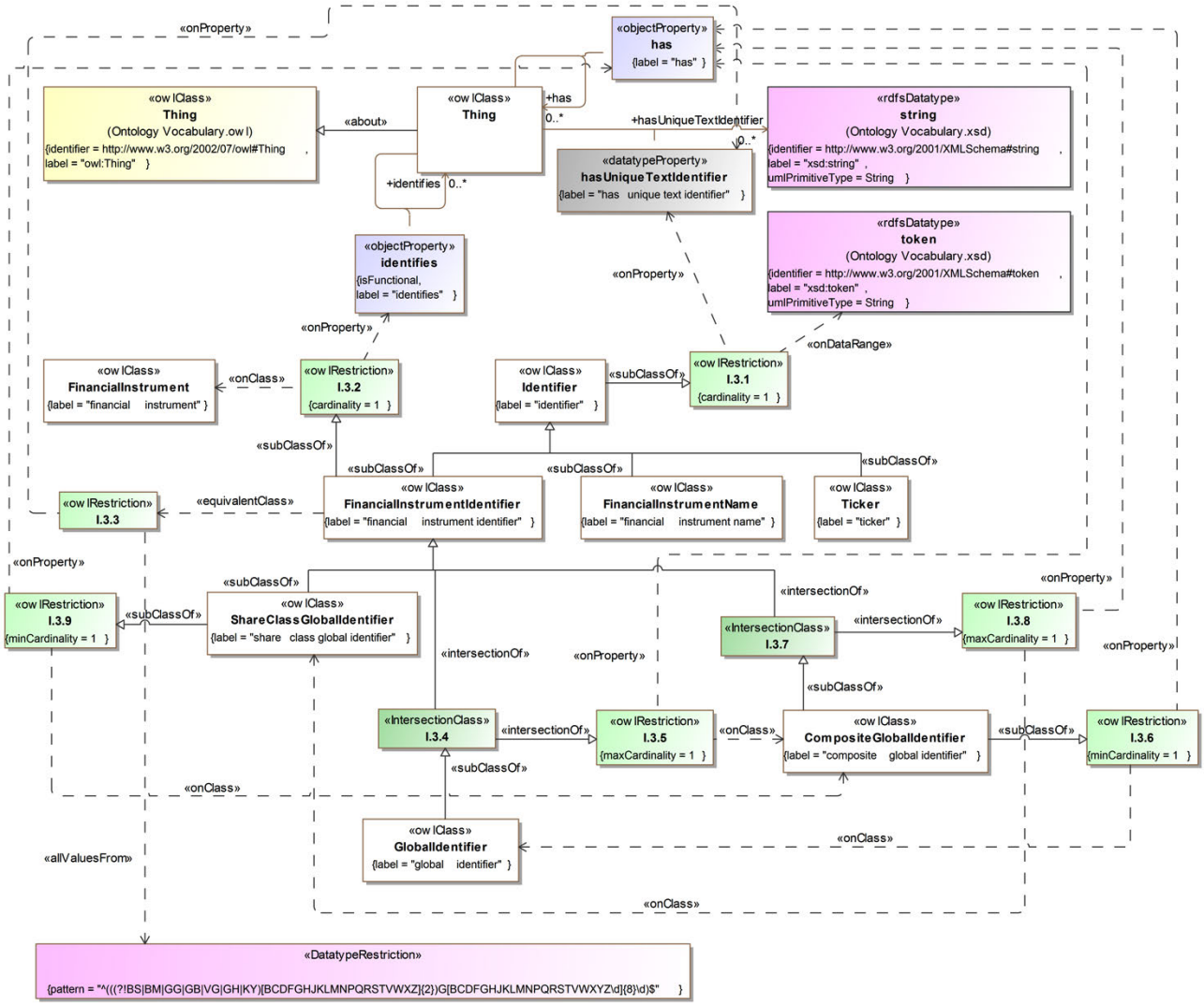

Figure 8.3 - Identifiers

Of note in this diagram is the additional DataTypeRestriction (I.3.3) placed on the Financial Instrument Identifier, in particular:

"^(((?!BS|BM|GG|GB|VG|GH|KY)[BCDFGHJKLMNPQRSTVWXYZ]
{2})G[BCDFGHJKLMNPQRSTVWXYZ\\d]{8}\\d)$"^^string]

This regex expression is in place to specify the syntactic restrictions on FIGI as specified in section 6.1. The breakdown is as follows:

- (?!BS|BM|GG|GB|VG|GH|KY): the first two characters cannot be any of the following strings:
  - 'BS'
  - 'BM'
  - 'GG'
  - 'GB'
  - 'VG'
  - 'GH'
  - 'KY'
- [BCDFGHJKLMNPQRSTVWXYZ]{2}: the above condition not-with-standing, the first two characters can be any combination of upper case consonants (including "Y").
- G: the third character shall be an upper case 'G'.

- [BCDFGHJKLMNPQRSTVWXYZ\\d]{8}: the next eight characters (positions 4 – 11) can by any upper case consonant or any single digit (trivially 0 – 9) numeral.
- \\d: the last character shall be a single digit (trivially 0 – 9) numeral.

What is absent from this DataTypeRestriction is the logic which dictates the calculation of the last character. This is specified in 6.2.2 but is not included in the OWL file as the calculation of the check digit would require an algorithm which is beyond the scope of regular expressions, e.g., javascript. At this point OWL 2.0 cannot support such code.

Class expression definitions for all expressions depicted in Figure 8.3, above, are given in Table 8.6.

Table 8.6 - Class Expression Definitions for Identifiers

Class Expression	Type	Label	Definition	Parent
CompositeGlobalIdentifier	class	composite global identifier	This represents the identifier for the composite for equity securities.	I.3.6, I.3.7
FinancialInstrument	class	financial instrument	Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.	F.2.1, F.2.2
FinancialInstrumentIdentifier	class	financial instrument identifier	A financial instrument identifier is an identifier that identifies (that is, labels the identity of) a financial instrument with a unique, persistent, semantically meaningless ID. The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification).	Identifier, I.3.2, I.3.3 (equivalence)
FinancialInstrumentName	class	financial instrument name	The English language name of the company or the financial instrument, e.g., a particular fund name, and sometimes include a brief description of the security or a differentiating feature, e.g., the issuance date. The name of an instrument may change in conjunction with corporate actions.	Identifier
GlobalIdentifier	class	global identifier	A 12 character alpha-numeric, randomly generated ID covering active and inactive securities. In total there will be more than 852 billion potential combinations available. The first 3 characters begin with ‘BBG’; positions 4-11 are alpha-numeric (less vowels) and the last digit is a check digit, which is calculated based on the Modulus 10 Double Add Double Formula.	I.3.4

Identifier	class	identifier	An identifier is a name that identifies (that is, labels the identity of) either a unique object or a unique class of objects, where the object or class may be an idea, physical (countable) object (or class thereof), or physical (noncountable) substance (or class thereof). The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). An identifier may be a word, number, letter, symbol, or any combination of those.	I.3.1
<blank node>	restriction	I.3.1	hasUniqueTextIdentifier exactly 1 xsd:string	
<blank node>	restriction	I.3.2	identifies exactly 1 FinancialInstrument	
<blank node>	restriction	I.3.3	hasUniqueTextIdentifier only xsd:string, pattern=">^(((?!BS|BM|GG|GB|VG)[BCDFGHJKLMNPQRSTVWXYZ]{2})G[BCDFGHJKLMNPQRSTVWXYZ\d]{8}\d)$	
<blank node>	intersection	I.3.4	intersection of (subclass of FinancialInstrumentIdentifier and I.3.5)	
<blank node>	restriction	I.3.5	has max 1 CompositeGlobalIdentifier	
<blank node>	restriction	I.3.6	has min 1 GlobalIdentifier	
<blank node>	intersection	I.3.7	intersection of (subclass of FinancialInstrumentIdentifier and I.3.8)	
<blank node>	restriction	I.3.8	has max 1 ShareClassGlobalIdentifier	
<blank node>	restriction	I.3.9	has min 1 CompositeGlobalIdentifier	
ShareClassGlobalIdentifier	class	share class global identifier	A Global Identifier assigned at the share class level so as to represent a hierarchy of Composite Global Identifiers. Since this identifier can be linked to more than one equity ticker, it will not load a single security. This class is only applicable to some securities, and excludes warrants.	Financial-Instrument-Identifier, I.3.9

Ticker	class	ticker	The assigned ticker. The rules for forming the ticker vary according to security class.	Identifier

8.2.6 Security Types

As discussed in 6.2.6, 6.3.8, and 7.2 Financial Instruments are further classified by specific Security. Security types and their relationships are specified below in Figure 8.4.

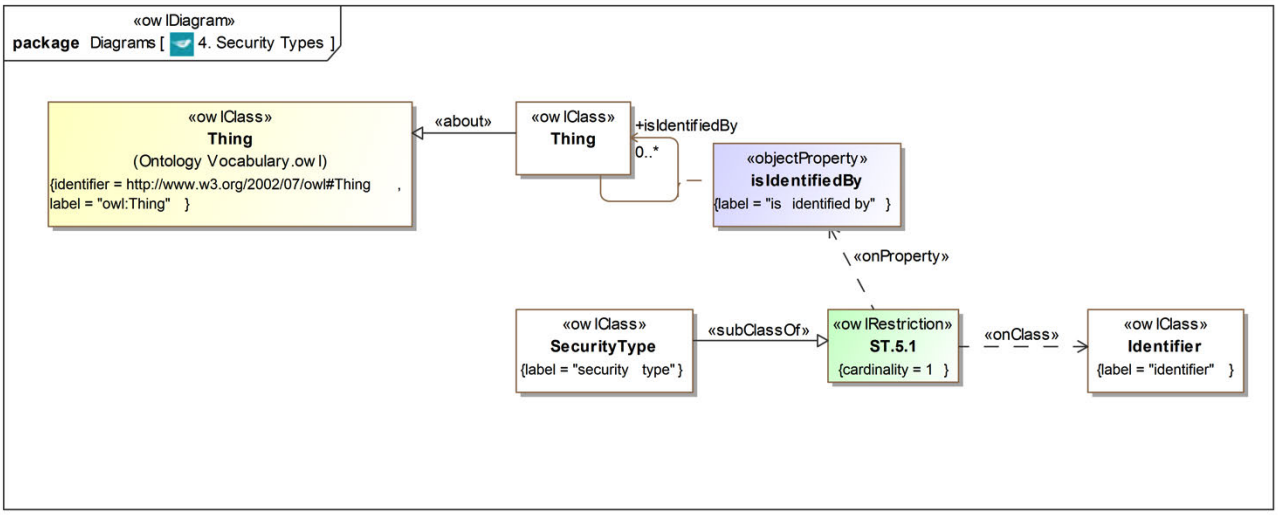

Figure 8.4 - Security Types

Class expression definitions for all expressions depicted in Figure 8.4 are given in Table 8.6.

Table 8.6 - Class Expression Definitions for Security Types

Class Expression	Type	Label	Definition	Parent
<blank node>	restriction	ST.5.1	hasUniqueTextIdentifier exactly 1 xsd:string	
SecurityType	class	security type	The type of security, for example, common stock.	ST.5.1, ST.5.2

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Annex A: Shared Semantics Treatments

(Informative)

The Financial Instrument Global Identifier is, in many ways, a complement to FIBO. The objective of FIBO includes providing a model of financial instruments as part of the model of the financial industry. The Financial Instrument Global Identifier is not, properly speaking, a part of that. The FIGI model does not specify a conceptual model of the financial instruments themselves, after all. Rather, it provides a concrete model for references, both descriptive and technical, for those instruments. FIGI is also designed to be mapped to the relevant aspects of FIBO as the modules describing financial instruments at the conceptual level become available.

Since the scope of the Financial Instrument Global Identifier is exclusively focused on Financial Instruments, the only part of FIBO that needs careful attention in the context of this standard is the treatment of Financial Instruments. Based on the latest ontology architecture information available for FIBO, definitions for financial instruments will span multiple specifications, each containing a number of modules and individual ontologies, none of which are available as OMG standards as of this writing.

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Annex B: Creation of New Identifiers

(Informative)

B.1 General

There will be two mechanisms by which an organization other than the designated Registration Authority (RA) can initiate the creation of new identifiers. It is recognized that a single RA individual can anticipate all possible market needs for identifiers. And while an RA can certainly provide a broad coverage of the market, there are inevitable market needs that will emerge over time. To this end, in addition to establishing additional RAs, two mechanisms for creation of new identifiers are proposed: 1. Request Service. 2. Certified Provider (CP) status. Each is explicated below.

B.2 Request Service

The simplest manner in which a new identifier or a set of new identifiers can be created is through the use of a request service whereby an organization interested in having an identifier or set of identifiers established simply issues a request to the RA which results in the RA creating a new identifier(s).

As has been noted throughout this document, the uniqueness of identifiers is vitally important. This applies not only to the actual twelve-character string used as an identifier, but also to the instrument(s) identified. Simply put, a single financial instrument, appropriately defined, can only have one identifier. So, in order to issue a new identifier, two things must be in place:

1. Uniqueness of the identifier: A mechanism by which it is ensured that the newly assigned twelve-character string(s) is unique.
2. Novelty of the financial instrument: A mechanism by which is it ensured that the financial instrument(s) being identified are not already identified by another twelve-character string.

Meeting condition 1 is trivial: since the RA serves as the system of record for all FIGIs, assigning a novel FIGI is merely a matter of creating a new identifier and checking against the existing inventory to ensure that the identifier is new. Exactly how the RA (or a CP, see below) might elect to do this is left open to the organization in question, provided that uniqueness obtains.

Meeting condition 2 is much more elaborate than was meeting condition 1. The conceptual model of a financial instrument that has been employed in this standard, however, is key to addressing this issue. As explicated in Section 6 of this standard, a financial instrument is identified by multiple things, is classified by multiple things, and is associated with multiple things. It is this collection of relationships that need to be understood so as to ensure that a given financial instrument has not already been assigned an identifier. So, the following data points need to be reviewed in order to confirm that the Financial Instrument in question has not yet been assigned an Identifier:

- Name
- Ticker (if applicable)
- Exchange Code
- Pricing Source (if applicable)
- Security Type

Owing to the diverse nature of financial instruments, it is expected that additional data points will be required, particularly as the coverage provided by FIGI expands, to provide decisive identification of financial instruments. (If such is viewed as necessary by either the Registration Authority or by a Certtified Provider (see B.3), a revision of this

specification will be required so as to fully document the additional classes or vocabularies.) In any event, once the uniqueness of the financial instrument is established, then condition 1 can be met by issuing a new identifier.

In order to request a new identifier, therefore, it is necessary that the requester provide the data points corresponding to the the above six data points (where applicable) so as to identify the financial instrument as well as any additional data points that might be required moving forward. Further, it is incumbent upon the RA to provide a request mechanism that easily accommodates the multi-faceted requests, both in one-off format and in bulk (perhaps with restrictions on the number per request), in a simple and easy to use manner, e.g., a web site, web service or an ftp drop box.

B.3 Certified Provider (CP)

It is recognized that some organizations may have an interest in the creation of such a volume of identifiers that utilizing a request service as outlined in C.1. is simply insufficient for their needs. This, coupled with the fact that the FIGI standard is an open standard, requires that a set of mechanisms and processes be defined so as to accommodate alternative issuers of identifiers.

Certified Providers are self-identified and nominated (self-nomination included) as potential Certified Providers to both the OMG Finance Domain Task Force and the RA. A committee consisting of at least one representative from the RA and at least one OMG member organization that is not the RA (CP evaluation committee) will evaluate the nomination of the CP according to the following criteria:

1. Does the potential CP have the necessary infrastructure in place or in a funded, scheduled infrastructure project that is sufficient to:
    a. Scalably store and maintain the repository necessary to provide FIGIs?
    b. Scalably, and with sufficient redundancy, provide only access to the FIGIs it creates?
    c. Provide a sufficiently robust API interface to support the registration of new FIGIs and related items?
2. Is the potential CP committed to providing the above services in perpetuity with no restrictions on redistribution and absolutely no charge to any potential user or organization?

The CP evaluation committee will issue their response to the application within six (6) months/two OMG meetings of the completed application being presented to the Finance Domain Task Force at an OMG meeting. The response will provide appropriate documentation explaining why the decision was made as it was if the outcome is not positive. In the event of a negative outcome, the potential CP is free to reapply for CP status anytime in the future through the above process.

The two conditions outlined above, 1. Uniqueness of the identifier and 2. Novelty of the financial instrument are both highly relevant and, as it happens, a bit more complex in the case of a CP. The complexity stems from the fact that there will only be one comprehensive system of record that can serve to ensure that conditions 1 and 2 are met: the inventory maintained by the RA. To address this complexity, the mechanism and processes by which CPs can create identifiers needs to be considered from both the perspective of the potential CP as well as from the perspective of the RA. We begin with the RA.

B.3.1 Registration Authority (RA) role

The RA, as the keeper of the comprehensive inventory of identifiers needs to ensure that both conditions 1 and 2 are met prior to an identifier being issued. When the RA itself is issuing an identifier, this is relatively simple as outlined in C.1. When an identifier is requested by a CP, however, the situation is different. Regarding condition 1: the uniqueness of the identifier, an allocation system for two letter prefixes as outlined below in Annex C addresses that easily enough. Regarding condition 2: the uniqueness of the financial instrument requires a bit more effort.

Given the data points associated with a given financial instrument as discussed in C.1, determining if an instrument has already been assigned an identifier within the confines of the RA environment is not overly complex. In the case of a Certified Provider, however, there are two infrastructures at play: the RA infrastructure and the CP infrastructure. So, in order to ensure that condition 2 is met, the RA will need to provide an API that will permit each CP to check their proposed financial instrument against the existing inventory as part of the registration process. As it is possible that two CPs might elect to assign identifiers (trivially different twelve-character strings, see Annex C) within a small window of

time, it is necessary that this check occur at the time of registration, which will be after the time when the CP has assigned an identifier string, as opposed to a preliminary step prior to the assignment of the string. This way, at any given time there will be either zero (0) or one (1) twelve-character string assigned to any given financial instrument with no need to "hold" a spot.

As part of the process whereby this lookup is supported a clearly communicated service level agreement must be established. Exactly what that will be will be determined and communicated prior to the service being set into place and will depend, in part, on the architecture of the service as well as the security infrastructure through which the communications will need to pass.

B.3.2 Certified Provider (CP) role

Like the RA, the CP will be responsible for ensuring that conditions 1 and 2 are met. In this case, however, the CP is not expected to check for conditions 1 and 2 against the entire inventory of financial instruments. Rather, they are only responsible for checking that conditions 1 and 2 are met against their own inventory. Once it is determined that a candidate financial instrument is not already present in the CPs inventory and that the identifier assigned to the instrument is unique within the CPs inventory (again, the uniqueness of identifiers across inventories is assured given the allocation rules specified in Annex C), the CP issues a call to the API provided by the RA to register the financial instrument and the identifier assigned to it. There are three possible outcomes, all of which will be communicated back to the CP:

1. The registration is accepted and the financial instrument and identifier are inserted into the RAs comprehensive inventory thereby making it/them available for use.
2. The registration is rejected because:
    a. The instrument is already present in the comprehensive inventory, in which case the identifier will be communicated back.
    b. The data points provided to describe the instrument was incomplete or otherwise non-computable, in which case the offending data elements will be specified in the communication back.
3. Manual review of the request is required owing to some ambiguity or other issue; in which case an estimated time of resolution will be communicated back (within the constraints of an established SLA). This is expected to be a very rare occurrence and is included here for the sake of logical completeness.

In the event that a registration is rejected because the instrument is already present in the comprehensive inventory, it is up to the CP whether they put the identifier string back into their unused inventory or not. Given that each CP will have an initial allotment of roughly 852 Billion identifiers, inventory control is not a high priority.

B.4 New Security Types and new Pricing Sources

In addition to new identifiers, new Security Types and new Pricing Sources can, and will, be created from time to time. The mechanism by which these can be created are entirely parallel to the mechanisms by which new identifiers are created. In particular, as the two conditions necessary for a new identifier: 1. Uniqueness, and 2. Novelty, apply also the Security Types and Pricing Sources, the exact same process will be followed:

- The Registration Authority, as the holder of the definitive repository, is responsible for confirming the uniqueness and novelty of each new Security Type and Pricing Source it creates.
- The Certified Provider(s) are responsible for:
    - Confirming the uniqueness and novelty of each new Security Type and Pricing Source it creates against their own inventory.
    - Making a call to the RA's API to confirm the global uniqueness and novelty of the new vocabulary item.

- It is expected that this process can either stand alone as the registration of a vocabulary item or can be packaged as part of the request process for a new identifier which is such that a new vocabulary item is required to support it.

Annex C: Allocation of Identifier Prefixes

(Informative)

The total possible inventory of identifiers is in excess of 600 Trillion. Each two letter prefix can be associated with over 852 Billion identifiers given the logic by which the identifiers are governed. While these numbers are sufficient to give us comfort from a statistical perspective that duplicate identifiers will not be generated, a mechanism by which specific two character prefixes are allocated and managed is necessary to ensure that duplication does not occur across different providers. To this end, the following logic will be employed:

Given that all grandfathered identifiers (those specified prior to the adoption of this standard and numbering over 150 Million) have been generated by a single organization and all begin with the "BB" as the first two letters:

- The organization currently issuing identifiers will continue to issue identifiers using the "BB" prefix until such time as the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point they will select another two letter prefix following the same process as other organizations.

- Other organizations that wish to create identifiers will have the opportunity to select a two letter prefix from the unused inventory of two letter prefixes. In order to secure a particular two letter prefix, the following conditions must be met:
    - The organization shall demonstrate that they either currently have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities or have in place a funded project by which they will have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities within 18 months of approval.

    - The application for a new two letter prefix is presented in writing to both the relevant part of the OMG as well as the RA at least six (6) months prior to the anticipated approval date.

- If an issuing organization that has secured an identifier does not issue at least one identifier within six months of establishing the operational ability to create identifiers, the two letter prefix will be returned to the open inventory not withstanding any other written agreements between the issuing organization, OMG, and the RA to the contrary.

Once a two letter prefix is established and in use by a particular issuer, the issuer is restricted to issuing identifiers using only that prefix until such as time as all of the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point they will be allocated another two letter prefix following the same process as outlined above.

The process flow by which CPs are established is as illustrated below:

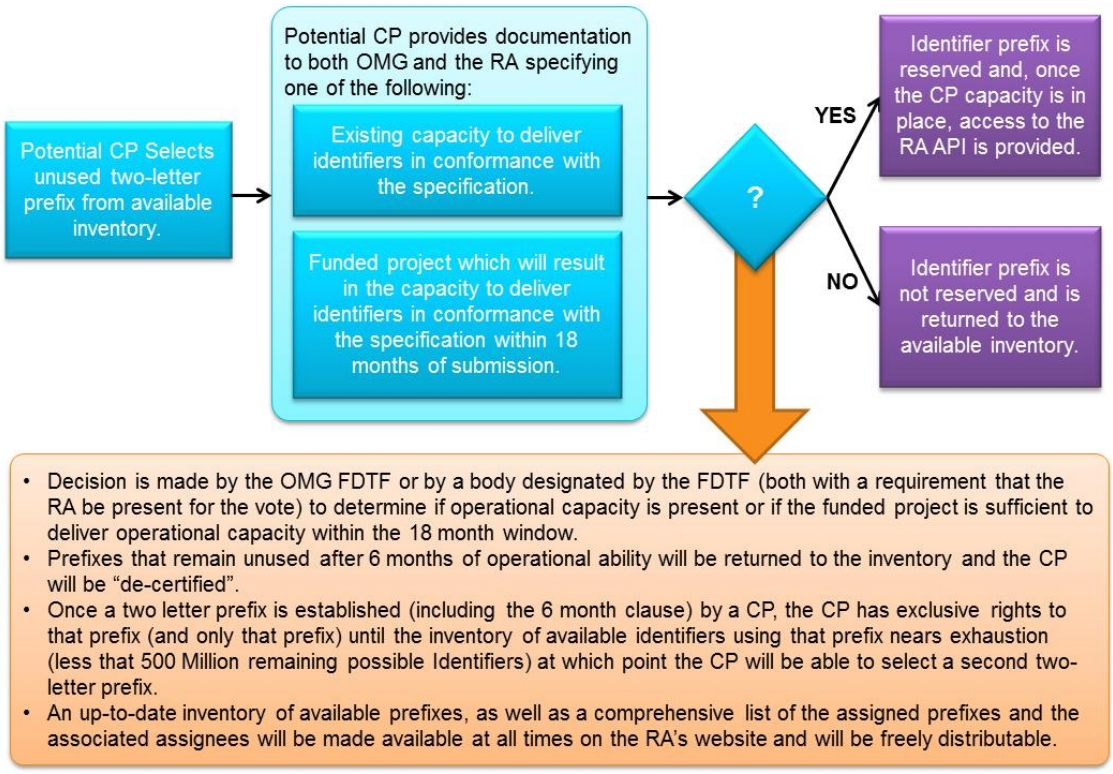

Figure C.1 - Allocation of Certified Providers and Prefixes

Annex D: Other Standards in the Financial Space

(Informative)

D.1 Introduction

While the Financial Instrument Global Identifier specification is intended as a stand-alone specification which is focused on the integrity of unique, persistent identification of Financial Instruments, the fact remains that there are standards in place at any given time that speak to Financial Instruments and may, therefore, intersect with or overlap with the FIGI specification. The purpose of this annex is to provide some acknowledgement of those facts and to proactively counter any confusion that might arise. To that end, this appendix will consist of a listing of the relevant standards and a brief treatment of the relationship between those standards and FIGI. Again, as there are constantly emerging and evolving standards, it is expected that this appendix will change over time as part of the revision process.

D.2 ISO 6166 (ISIN)

The ISIN standard overlaps with the FIGI standard in that it, too, seeks to assign unique identifiers to Financial Instruments. It differs, however, from the FIGI in a number of critical ways which will be explicated below. Because of the overlap and the differentiation, FIGI and ISIN can be viewed as complimentary, rather than competing, standards.

The ISIN and the FIGI differ in three broad ways:

1. Scope: The FIGI provides, both in practice and in future implementation, a much broader scope than does ISIN. In particular, FIGI identifies not only securities, but, potentially, all financial instruments. The reason that the scope is so much broader is a function of purpose: the ISIN is focused on serving as a reference for a fungible instrument at the initial issuance level, which serves a proper and needed function in and of itself. FIGI, in contrast, while capable of serving in that capacity, is focused on providing a consistent and unique data point that serves to identify financial instruments and the different contexts they exist in throughout their lifecyle, so as to enable robust and comprehensive data management and, from that, compliance.

2. Granularity: The ISIN provides a single identifier at the single issued level for a fungible instrument. FIGI, in contrast, provides not only that in the form of the Share Class Global Identifier (hence the overlap), but also at the country level through the Composite Global Identifier, and, where applicable, at the trading venue level as well.

3. Persistence: Corporate actions, such as name changes, acquisitions, corporate relocations, and so on, can result in the need for an ISIN to change. This is not intended as part of the ISO 6166 specification, but is a function of the distributed delivery system for ISINs. Such is not the case with FIGIs in that the characters present in the FIGI string are, with the exception of the check digit, entirely meaningless. As such, there is no hidden reference to the currency, market or country location, or company name present in the identifier—a condition which is consistently present in ISINs.

Organizations that are licensed to use ISIN are free to map between FIGI and ISIN at the Global share class level. Indeed, this is a common practice. Owing, however, to licensing restrictions on ISIN (though not on FIGI), such mappings cannot be freely redistributed.

D.3 ISO 10962 (CFI)

The Classification of Financial Instruments (CFI) code is a six character string that serves to classify financial instruments both at a high-level, e.g., debt instruments vs equities, and through their attributes, e.g., fully paid vs partly paid. In a sense, this can be viewed as related to the Security Type vocabulary that is part of the FIGI specification. The mechanism by which the distinctions are made, beyond the top levels, however are very different and so these should be viewed as complimentary classification systems.

The mechanism by which CFI distinguishes between Financial Instruments at the granular level is largely a function of the legal distinctions that govern the acquisition and disposition of such instruments. For example, Future Contracts will be differentiated by whether the terms are standardized or non-standardized. In contrast, the different security types that inform FIGI reflect the manner(s) in which a financial institution would classify their positions for multiple operational and regulatory reporting purposes, and may be influenced by jurisdiction.

As with other standards, it is possible, indeed common, for organizations to map their holdings to both the FIGI listing of Security Types and to CFI. Distribution of the CFI mapping is not, however, part of the FIGI specification, nor it is required as part of FIGI compliance within the standard (though it is not precluded).

D.4 ISO 20022 (UNIFI)

ISO 20022 is a messaging standard what specifies the structure of a metadata repository containing descriptions of messages and business processes. The relationship between ISO 20022 and FIGI is potentially an intersecting, rather than overlapping, relationship. In particular, given that the identifiers associated with FIGI are, potentially, items that would be embedded in messages used within the financial sector, there is the potential that FIGI would be formally recognized as having a place within ISO 20022. Strictly speaking, however, ISO 20022 and FIGI are entirely independent of one another as they seek to do very different things.

D.5 ISO 10383 (MIC)

The Market Identifier Code (MIC) provides a universal method of identifying exchanges, trading platforms, and regulated or non-regulated markets as sources of prices and related information for Financial Instruments. This function overlaps with parts of FIGI, in particular, the Pricing Source. As with ISIN, there are key differences.

1. Scope: The MIC provides identification of places where securities can be, broadly speaking, bought and sold. As such, it only applies to tradable securities that are exchanged at a venue (broadly understood). The list of pricing sources present in FIGI goes far beyond this to support Financial Instruments that are not exchanged at a venue. In fact, FIGI can support Financial Instruments that are not tradable at all, e.g., an individual person's home mortgage contract (not currently supported, but under consideration).

2. Embeddedness: The MIC code is a stand-alone code that identifies a Market. As such, it serves a different purpose than does the Pricing Source attribute of FIGI. The Pricing Source attribute of FIGI serves as a differentiator of otherwise identical financial instruments and that differentiation is embedded into the Financial Instrument Global Identifier. In the case of the MIC, it can be used in concert with the ISIN to deliver this to some level, but it is not fully embedded into the identifier's meta data.

As is the case with other standards, there is nothing precluding any organization from mapping FIGIs to MIC codes. It is not, however, part of the formal requirements of the FIGI.

Open Symbology Fields

- **Name** (NAME)
  - Name of the company or brief description of the instrument. The Name of an instrument may change in conjunction with corporate actions.
- **Ticker** (TICKER)
  - Ticker is a specific identifier for a financial instrument that reflects common usage. Tickers are not, however, unique to specific exchanges or specific pricing sources. Tickers may change in conjunction with Corporate Actions.
- **Exchange Code** (EXCH_CODE)
  - Code for the trading venue or environment on which the instrument trades. If an exchange is specified, the code will be for the specified exchange. When not specified, the code will be according to the user default exchange, which can be the composite or primary exchange.
- **Security Type** (SECURITY_TYP)
  - Description of the specific instrument type within its market sector.
- **Security ID Number Description** (ID_BB_SEC_NUM_DES)
  - Descriptor for a financial instrument.
    - *Equities: Not unique on the exchange level; must be combined with Feed Source (DX282, FEED_SOURCE) to achieve a unique value at the exchange level.*
- **Market Sector Description** (MARKET_SECTOR_DESCRIPTION)
  - Market Sector refers to the asset type assigned to the instrument.
- **Financial Instrument Global Identifier** (ID_BB_GLOBAL)
  - Twelve character, alphanumeric identifier. The first 2 characters are upper-case consonants (including "Y"), the third character is the upper-case "G", characters 4 -11 are any upper-case consonant (including "Y") or integer between 0 and 9, and the last character is a check-digit. An identifier is assigned to instruments of all asset classes, is unique to an individual instrument and once issued will not change for an instrument. For equity instruments an identifier is issued per instrument per trading venue.
- **Composite Financial Instrument Global Identifier** (COMPOSITE_ID_BB_GLOBAL)
  - Twelve character, alphanumeric identifier. The first 2 characters are upper-case consonants (including "Y"), the third character is the upper-case "G", characters 4 -11 are any upper-case consonant (including "Y") or integer between 0 and 9, and the last character is a check-digit. The Composite level of assignment is provided in cases where there are multiple trading venues for the instrument within a single country or market. The Composite Financial Instrument Global Identifier (FIGI) enables users to link multiple FIGIs at the trading venue-level within the same country or market in order to obtain an aggregated view for that instrument within that country or market.
- **Share Class Financial Instrument Global Identifier** (ID_BB_GLOBAL_SHARE_CLASS_LEVEL)

  - Twelve character, alpha-numeric identifier. The first 2 characters are upper-case consonants (including "Y"), the third character is the upper-case "G", characters 4 -11 are any upper-case consonant (including "Y") or integer between 0 and 9, and the last character is a check-digit. A Share Class level Financial Instrument Global Identifier is assigned to an instrument that is traded in more than one country. This enables users to link multiple Composite FIGIs for the same instrument in order to obtain an aggregated view for that instrument across all countries globally.

- **Unique Identifier** (ID_BB_UNIQUE)
  - A legacy identifier assigned to all instruments. The construction and length of this identifier is different across asset classes. This identifier can also change as a result of corporate actions.
- **Security Type 2** (SECURITY_TYP2)
  - A description of the security type.
- **Security Description** (SECURITY_DES)
  - A description of the security
- **Unique Identifier for Future Option** (UNIQUE_ID_FUT_OPT)
  - Unique ticker with logic for index, currency, single stock futures, commodities and commodity options. This identifier differs from the Unique Identifier in that it is a logical ticker.
- **Market Sector Number** (MARKET_SECTOR)
  - Number of the market sector of the security. Possible returns are:
    1 = Commodity
    2 = Equity
    3 = Municipals
    4 = Preferred
    6 = Money Market
    7 = Government
    8 = Corporate
    9 = Index
    10 = Currency
    11 = Mortgage
- **Security Short Description** (SECURITY_SHORT_DES)
  - Alternate Short Description for a given security comprised of the ticker, coupon and maturity year (YY). For strips it returns the ticker, coupon, and maturity (M/YY). For corporate securities with Japanese tickers, the series will also be displayed.