FIX TRADING COMMUNITY
Americas Trading Conference 2022

– Orchestra in Action –

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Agenda

- FIX Tools
  - GUI tools
  - Open-source tools

- Generating a Tablature markdown file
  - Getting started
  - Log2Orchestra
  - Playlist
  - Tablature

- Generating Rules of Engagement
  - Markdown
  - Style reference document

Orchestra in Action
FIX Tools

FIX Tools – Introduction

- Objectives

  - FIX tools are intended to ease and increase the adoption of FIX standards
  - GTC uses the FIX tools for the maintenance of the FIX standards
  - FIX is not a vendor and offers tools on a best effort basis
  - Some of the tools are provided as open-source on GitHub, contributions welcome!

- GUI Tools

  - FIXimate – visualization of FIX Latest
  - Log2Orchestra – creation of Orchestra XML file from FIX engine logfile(s)
  - Playlist – creation of subset of existing Orchestra XML file

- Open-source tools

  - Tablature – conversion tool between Orchestra XML and Tablature markdown
  - Repository utilities (e.g. Validator, XmlDiff, XmlMerge)

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FIX Tools – FIXimate

FIXimate^{sm} v4.0.2
FIXimate User Guide
Disclaimer
Release Notes
Download latest EP FIXimate
FIXimate3 for legacy versions

FIX.Latest_EP273 - English

Find all: [Pattern] **Search**
Regex match: ^=start, $=end, .=any char
☐ Match abbreviated name only

Message type: [D] **Lookup**
Component: [Name] **Lookup**
Field tag: [Tag] **Lookup**
Field name: [Name] **Lookup**
Code set: [Name] **Lookup**

About this orchestration
Message Summary
Components
Fields
   Sorted by Tag Number
   Sorted by Field Name
   Sorted by Datatype
   User Defined Fields
Code Sets
Datatypes

Message Layouts
Session
PreTrade
Trade
- SingleGeneralOrderHandling
  - DontKnowTrade
  - ExecutionAck
  - ExecutionReport
  - NewOrderSingle
  - OrderCancelReject
  - OrderCancelReplaceRequest
  - OrderCancelRequest
  - OrderStatusRequest
- ProgramTrading
- OrderMassHandling
- CrossOrders
- MultilegOrders
PostTrade
Infrastructure

FIX.Latest_EP273 Message

NewOrderSingle [type 'D']

<Order>

The new order message type is used by institutions wishing to electronically submit securities and forex orders to a broker for execution.

The New Order message type may also be used by institutions or retail intermediaries wishing to electronically submit Collective Investment Vehicle (CIV) orders to a broker or fund manager for execution.

Pedigree Added FIX.2.7
Expand Components | Collapse Components

Field or Component	Field Name	Abbr Name	Req'd	Comments	Pedigree
Component	StandardHeader	Hdr	Y	MsgType = D	Added FIX.2.7
11	ClOrdID	ID	Y	Unique identifier of the order as assigned by institution or by the intermediary (CIV term, not a hub/service bureau) with closest association with the investor.	Added FIX.2.7
2422	OrderRequestID	OrdReqID			Added EP188
526	SecondaryClOrdID	ID2			Added FIX.4.3
583	ClOrdLinkID	LnkID			Added FIX.4.3
2829	DuplicateClOrdIDIndicator	DupClOrdIDInd			Added EP253
Component	Parties	Pty		This is party information related to the submitter of the request.	Added FIX.4.3 Updated EP131
Component	TargetParties	TgtPty		Identifies parties not directly associated with or owning the order, who are to be informed to effect processing of the order.	Added EP131
229	TradeOriginationDate	OrignDt			Added FIX.4.3

Tag	Field Name	Abbr Name	Data Type	Union Datatype	Description	Pedigree
11	ClOrdID	ClOrdID / ID in SingleGeneralOrderHandling	String		Unique identifier for Order as assigned by the buy-side (institution, broker, intermediary etc.) (identified by SenderCompID (49) or OnBehalfOfCompID (5) as appropriate). Uniqueness must be guaranteed within a single trading day. Firms, particularly those which electronically submit multi-day orders, trade globally or throughout market close periods, should ensure uniqueness across days, for example by embedding a date within the ClOrdID field.	Added FIX.2.7

Used in messages:
[CollateralAssignment][CollateralInquiry][CollateralInquiryAck][CollateralReport][CollateralRequest][CollateralResponse][Email][ExecutionAck][ExecutionReport][MultilegOrderCancelReplace][NewOrderMultileg][NewOrderSingle][OrderCancelReject][OrderCancelReplaceRequest][OrderCancelRequest][OrderMassActionReport][OrderMassActionRequest][OrderMassCancelReport][OrderMassCancelRequest][OrderStatusRequest][QuoteRequest][QuoteResponse][RegistrationInstructions][RegistrationInstructionsResponse][SettlementInstructions][TradeCaptureReportRequest]

Used in components:
[InstrmtStrkPxGrp][ListOrdGrp][OrdAllocGrp][OrdListStatGrp][OrderAggregationGrp][OrderEntryAckGrp][OrderEntryGrp][SideCrossOrdCxlGrp][SideCrossOrdModGrp][TradeReportOrderDetail]

FIX Tools

- Log2Orchestra (FIX members only)

  - Automatic creation of an Orchestra XML file with FIX engine logfiles as input

  - Logfiles encoded in FIX TagValue with automatic detection of delimiter

  - Orchestra XML reference file to retrieve meta-data from tag number

  - Integrated access to public GitHub project for official reference files from FIX
    https://github.com/FIXTradingCommunity/orchestrations

- Playlist (FIX members only)

  - Web-based visualisation of input file with check boxes for selections of messages, groups, components, their fields and values of these fields

  - Automatic selection of check boxes with selector file

  - Export of selected subset into a new Orchestra XML file

  - Read-only sections for fields and datatypes (automatically selected)

  - Integrated access to public GitHub project for official reference files from FIX
    https://github.com/FIXTradingCommunity/orchestrations

FIX Tools – Log2Orchestra

FIX Log to Orchestra

Creates an Orchestra file from one or more FIX message logs (tag-value encoding)

Input

Reference Orchestra file

⬆

Drag file to read or

Choose File

FIX Standard

FIX message log files

⬆

Drag file to read or

Choose Files

Configuration file for scenarios (optional)

⬆

Drag file to read or

Choose File

Clear Input Files

Output

Orchestra file to create (*.xml)

myorchestra.xml

☐ Append only (removes no scenarios)

Create Orchestra file

Terms of Service

Help

- Log2Orchestra creates a FIX Orchestra XML file from one or more log files of a FIX engine.

- Fields (including user defined fields), values, components, and messages are captured.

- The web interface tool runs in a browser; parsing is done within the web browser and delivers a file without any data leaving the user's environment.

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FIX Tools – Playlist

FIX Playlist

Creates a subset of an Orchestra file

FIX orchestra

Input

Source Orchestra file

100%

Drag file to read or

[Choose File]

[FIX Standard]

OrchestraFIXLatest.xml

[Use Selector File]

[Clear Input File]

Output

Orchestra file to create (*.xml)

myorchestra.xml

[Create Orchestra file]

[User Guide] [Terms of Service]

Version 1.1
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Select Your Content

(All elements sorted alphabetically. Greyed out items are deprecated)

[+] ☐ MESSAGES
[+] ☐ GROUPS
[+] ☐ COMPONENTS
[-] ☐ FIELDS
    [+] ☐ Tags 1-999
    [+] ☐ Tags 1000-1999
    [+] ☐ Tags 2000-2999
    [+] ☐ Tags 40000-49999
[+] ☐ CODESETS
[+] ☐ DATATYPES

[-] ☑ NewOrderSingle(35=D)
☑ Account(1) - Type String
☐ AccountType(581) - Type AccountTypeCodeSet
☐ AcctIDSource(660) - Type AcctIDSourceCodeSet
☐ AffiliatedFirmsTradeIndicator(2525) - Type Boolean
☐ AllocID(70) - Type String
☐ AuctionAllocationPct(1804) - Type Percentage
☐ AuctionInstruction(1805) - Type AuctionInstructionCodeSet
☐ AuctionType(1803) - Type AuctionTypeCodeSet
☐ BookingType(775) - Type BookingTypeCodeSet
☐ BookingUnit(590) - Type BookingUnitCodeSet
☐ CancellationRights(480) - Type CancellationRightsCodeSet
☐ CashMargin(544) - Type CashMarginCodeSet
☑ ClOrdID(11) - Type String
☐ ClOrdLinkID(583) - Type String
☐ ClearingAccountType(1816) - Type ClearingAccountTypeCodeSet
☐ ClearingFeeIndicator(635) - Type ClearingFeeIndicatorCodeSet
☑ CommissionData - Component
☐ CommissionDataGrp - Group
☐ ComplianceID(376) - Type String
☐ ComplianceText(2404) - Type String
☐ ContraOrderOrigination(2882) - Type OrderOriginationCodeSet
☐ ContraRoutingArrangmentIndicator(2884) - Type RoutingArrangmentIndicatorCodeSet
☐ CopyMsgIndicator(797) - Type Boolean
☐ CoveredOrUncovered(203) - Type CoveredOrUncoveredCodeSet
☑ Currency(15) - Type Currency

FIX Tools – Tablature

- General

  - Open-source (Apache 2.0 licence) tool to convert between Orchestra XML and markdown
  - Available in GitHub (https://github.com/FIXTradingCommunity/tablature)

- Syntax

  - Section headings with keywords (e.g. "## Message") for a hierarchical structure
  - Markdown tables for definitions of messages, components, and field values
  - Fields referenced in message tables and defined in a single table across all messages
  - Field values (a.k.a. codes in code sets) are referenced with their symbolic names ("[…]" as shown in FIXimate, e.g. "[GoodTillDate]")

- Utilities

  - orchestra2md – Conversion of an Orchestra repository file to markdown
  - md2orchestra – Conversion of a markdown file to an Orchestra repository file

FIX Tools – Repository utilities

- GitHub landing pages for Orchestra

  - Resources: https://github.com/FIXTradingCommunity/fix-orchestra

  - Technical specification: https://github.com/FIXTradingCommunity/fix-orchestra-spec

- Educational material

  - Orchestra tutorials (https://github.com/FIXTradingCommunity/fix-orchestra/wiki)

  - Public Orchestra files (https://github.com/FIXTradingCommunity/orchestrations)

  - Experimental modules (https://github.com/FIXTradingCommunity/fix-orchestra-experimental)

- Utilities provided "as-is" under Apache 2.0 license

  - Repository validator and repository compressor

  - Generate QuickFIX dictionary from an Orchestra XML file

  - Generate Google Protocol Buffers schema from an Orchestra XML file

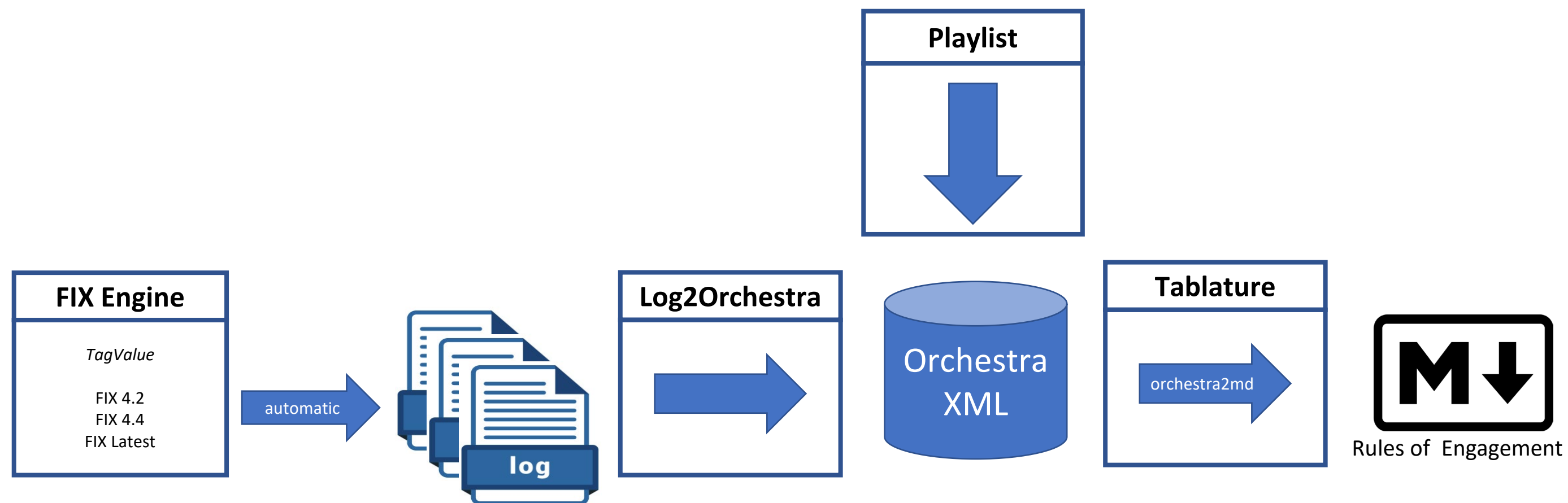 - Generate Simple Binary Encoding schema from an Orchestra XML file

  - ...

Orchestra in Action
Generating a Tablature markdown file

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Workflow – Getting started

- Option 1: start with Log2Orchestra (https://log2orchestra.fixtrading.org/)
  - Download Orchestra XML file of FIX Latest as reference file
  - Use Log2Orchestra to generate Orchestra XML file from your logfiles
  - Use Tablature to generate markdown file from your Orchestra XML file

- Option 2: start with Playlist (https://playlist.fixtrading.org/)
  - Download Orchestra XML file of FIX Latest as reference file
  - Use Playlist to select subset of FIX Latest representing your FIX interface
  - Use Tablature to generate markdown file from your Orchestra XML file

Playlist

FIX Engine

TagValue

FIX 4.2
FIX 4.4
FIX Latest

automatic

log

Log2Orchestra

Orchestra XML

Tablature

orchestra2md

Rules of Engagement

Log2Orchestra Input – FIX Engine logfile

- Log2Orchestra scans the logfile(s) for FIX TagValue syntax (rest is ignored), "guessing" the delimiter based on end of the standard "8=..." string.

- An Orchestra reference file (e.g. FIX Latest or your own Orchestra XML file) is used to retrieve additional information for the messages and fields (e.g. name and datatype).

- A single definition is generated for each FIX message type (e.g. NewOrderSingle(35=D)). It represents the superset of all fields and values found across all message instances.

- The output is a single Orchestra XML file that is fully compliant with Orchestra V1.0.

- Log2Orchestra can create scenarios per FIX message type based on the configuration of key fields (e.g. ExecType(150))

- Log2Orchestra can be run with the "append" option to add new scenarios to an existing Orchestra XML file

Log2Orchestra Input – FIX Engine logfile

```
8=FIX.4.4|9=463|35=8|49=ET_OMS|56=OMPP|34=12|52=20200302-
11:14:36.492|37=UUKO20030200001g|
11=IREACH_t182_LLOYLN.nx83e.j#a1|17=TTN-200302045107-
00000012|60=20200302-11:14:36.490|150=8|39=8|55=LLOYLN|
48=LLOY.L|22=5|167=CS|15=GBp|151=0|14=0|6=0.0|54=1|44=59.7
3|38=1000|32=0|31=0.0|58=[Order Limit price deviates from
reference price by 21.08 pct (> limit 10 pct)]|103=0|
20=0|115=HARRISEUAP|109=MERRILL LYNCH INTERNATIONAL|59=0|
63=0|40=2|207=LSE|10=205|
```

Output – Orchestra XML file

```
...
<fixr:message id="10006" name="ExecutionReport">
        <fixr:structure>
            <fixr:fieldRef id="11"/>
            <fixr:fieldRef id="37" presence="required"/>
            <fixr:fieldRef id="1"/>
            <fixr:componentRef id="10002"/>
            <fixr:fieldRef id="54" presence="required"/>
            <fixr:fieldRef id="31"/>
            <fixr:fieldRef id="32"/>
            <fixr:fieldRef id="151" presence="required"/>
            <fixr:fieldRef id="14" presence="required"/>
            <fixr:groupRef id="10005"/>
        </fixr:structure>
        <fixr:annotation>
            <fixr:documentation contentType="text/markdown">
                Relay fill information on a working order.
            </fixr:documentation>
        </fixr:annotation>
</fixr:message>
...
```

Log2Orchestra and Playlist both produce an Orchestra XML file

Tablature: Convert Orchestra to Markdown

```
...
## Message ExecutionReport type 8 (9)

The execution report message is used to...

| Name                         | Tag       | Presence | Implmaxlength |
|------------------------------|-----------|----------|---------------|
| StandardHeader               | component | required |               |
| ApplicationSequenceControl   | component | optional |               |
| OrderID                      | 37        | required |               |
| OrderRequestID               | 2422      | optional |               |
| MassOrderRequestID           | 2423      | optional |               |
| SecondaryOrderID             | 198       | optional | 20            |
| SecondaryClOrdID             | 526       | optional | 20            |
| SecondaryExecID              | 527       | optional |               |
| ClOrdID                      | 11        | optional | 20            |
| QuoteMsgID                   | 1166      | optional |               |
...
```

Maintenance Options

- Objective
  - Make changes to an existing interface representation (Orchestra XML or markdown)

- Manual edits of raw XML
  - Possible with an XML editor, but errors are easily made and hence not recommended
  - Simple conversion to markdown file with Tablature (orchestra2md)
  - A change may require updates in multiple places of the XML file, e.g. a new field with a code set

- Manual edits in Tablature markdown
  - Usage of an editor with syntax highlighting for markdown recommended
  - Markdown tables with extensive descriptions may be challenging
  - Simple conversion to Orchestra XML file with Tablature (md2orchestra)
  - Supports generation of specification documents with open-source software

- Specialized vendor tools
  - Graphical user interface is key to support usage by business analysts
  - May integrate open-source Tablature tool for automated conversions
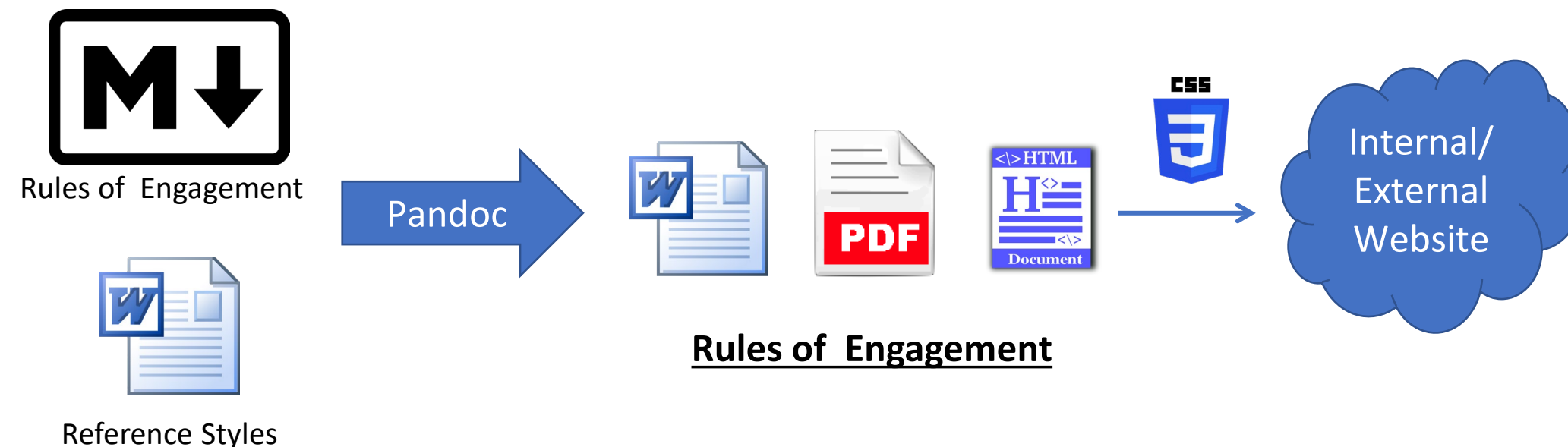 - Vendor tools for Orchestra V1.0 have become available this year

FIX Tools in Action
Generating Rules of Engagement

Workflow

- Rules of Engagement documents can be generated from Tablature markdown

- Enhance the initial markdown file generated with Log2Orchestra or Playlist with documentation and/or Orchestra features, e.g. conditional rules.

- Create a Pandoc (https://www.pandoc.org , open source) reference style document in Microsoft Word to define layout of your Rules of Engagement document.

- Generate your Rules of Engagement document (docx/pdf) from your markdown file with Pandoc using the reference style document and upload to your website for download.

- Optionally, generate an online version of your Rules of Engagement (html) for your website using your standard CSS file for layout.

From Tablature markdown to MS Word

```
...
## Message ExecutionReport type 8 (9)

The execution report message is used to...

| Name                        | Tag       | Presence | Implmaxlength | Values               |
|-----------------------------|-----------|----------|---------------|----------------------|
| StandardHeader              | component | required |               |                      |
| ApplicationSequenceControl  | component | optional |               |                      |
| OrderID                     | 37        | required |               |                      |
| OrderRequestID              | 2422      | optional |               |                      |
| MassOrderRequestID          | 2423      | optional |               |                      |
| SecondaryOrderID            | 198       | optional | 20            |                      |
| SecondaryClOrdID            | 526       | optional | 20            |                      |
| SecondaryExecID             | 527       | optional |               |                      |
| ClOrdID                     | 11        | optional | 20            | assign in.ClOrdID    |
| QuoteMsgID                  | 1166      | optional |               |                      |
...
```

Tablature markdown

Message ExecutionReport type 8 (9)

The execution report message is used to...

Name	Tag	Presence	Implmaxlength	Values
StandardHeader	component	required		
ApplicationSequenceControl	component	optional		
OrderID	37	required		
OrderRequestID	2422	optional		
MassOrderRequestID	2423	optional		
SecondaryOrderID	198	optional	20	
SecondaryClOrdID	526	optional	20	
SecondaryExecID	527	optional		
ClOrdID	11	optional	20	assign in.ClOrdID
QuoteMsgID	1166	optional		

Standard Pandoc

Pandoc with reference style document

13.2.1 ExecutionReport Message

Tag	Name	Req'd	Description
Component	StandardHeader	Y	MsgType = 8
Component	ApplicationSequenceControl	N	For use in drop copy applications. NOT FOR USE in transactional applications.
37	OrderID	Y	OrderID is required to be unique for each chain of orders.
2422	OrderRequestID	N	Required if provided on the order message. Echo back the value provided in the order message.
2423	MassOrderRequestID	N	Can be used to link execution to the MassOrder(35=DJ) message.
198	SecondaryOrderID	N	Can be used to provide order id used by exchange or executing system. Can alternatively be used to convey implicit order priority.
526	SecondaryClOrdID	N	–
527	SecondaryExecID	N	–
11	ClOrdID	N	Required when referring to orders that where electronically submitted over FIX or otherwise assigned a ClOrdID(11). In the case of quotes can be mapped to: - QuoteMsgID(1166) of a single Quote(35=S) - QuoteID(117) of a MassQuote(35=i). - MassOrderReportID(2424) of a MassOrderAck(35=DK)
1166	QuoteMsgID	N	In the case of quotes can be mapped to: o QuoteMsgID(1166) of a single Quote(35=S) o QuoteID(117) of a MassQuote(35=i)

Maintaining your Rules of Engagement