Minutes of the Federal Aviation Administration (FAA) System Wide Information Management (SWIM) Industry Collaboration Workshop and Full SWIM Industry-FAA Team (SWIFT) Meeting #9

February 25th and 26th, 2020

FedEx University Institute of Technology

The Zone, The University of Memphis, 365 Innovation Drive, Memphis, Tennessee 38152

Day One - SWIM Developer's Workshop

1. **Enhanced JumpStart Kit for Data Collection & Development Ideas– (Doug Harvey, L3HARRIS)**
    - 1.1.1.1. **Audience Questions & Answers/Challenges:**
        - 1.1.1.1.1. *Developers in the audience asked about how to handle production style bandwidth? How is the ingestion of raw data?*
            - *1.1.1.1.1.1. Doug provided that the widget he demoed was not consuming a large amount of data and therefore scaling was not needed but in situations where it does happen would be case by case so.*
            - 1.1.1.1.1.2. *However, Doug also recommends Grafana, a multi-platform open source analytics and interactive visualization software available. It can allow different data streams, it's all about users ensuring that their businesses have the architecture built in to support it*.
        - 1.1.1.1.2. For Operations-focused attendees, bridging the gap between getting from Alex's SCDS connection demo to Doug's data collection is a major challenge.
            - 1.1.1.1.2.1. Non-developers still find it hard to conceptualize, extract and visualize, and use the data they want.
            - 1.1.1.1.2.2. Upcoming Portal should help address this concern along with developer collaboration.

Day Two

2. **Producer Program Briefing: Traffic Flow Management System (TFMS): TFMS Request/Reply (Steven Lewandowski)**
    - 2.2.1.***Audience Questions & Answers*:**
    - 2.2.2.Erin Cobbett (Delta): Are there structural changes to TFMS data for TFMS R/R? Is there a certain logic that is needed to grab the TMI lists or is it just aggregation? The more understanding of the processing and business logic for TFMS, the better.
        - *2.2.2.1. Steven Lewandowsky: TMI update messages…its much quicker than traditional TFMS. It is aggregation and the result of the TFMS processing.*
        - 2.2.2.2. *Josh Gustin: There's a lot of history here. Now with CDM, we see the manifestation of data, including flow update info. A lot of these things have come out of a GUI interface. So, R/R is intended to real-time match what is seen in TFMS.*
    - *2.2.3.Marcus Lowther [Metron]: Comparisons to TFMS, are there any validation docs that we can reference to get a baseline for an FMS flight path and how we can compare it?*
        - *2.2.3.1. Steven Lewandowsky: Not aware of one, but this could power an FMS flight path because it powers real time updates.*

2.2.4. If they build their own table what is the logic that was in place or… is it just a filtering not adding additional logic?

2.2.4.1. Steven Lewandowsky: TFMS is not aggregation the list – can't provide the details in the form but will be able to follow up offline as needed.

2.2.4.2. David Almeida: ***E-IDS*** – get with us [Ops and Dev/Focus Groups] on this to help develop use case and widget and further flush this issue out.

2.2.4.3. Al Capps (NASA): E-IDS hasn't been invested in yet, I suggest looking through NTML entries. There needs to be some procedural changes to retrieve data for the system today. ***TFMS process and logic would be great for a CDM community discussion.***

3. Special Topic: Flight and Flow for an Information Collaborative Environment (FF-ICE) (Ray Ahlberg – FAA, AJV-S)

3.2. ***Audience Questions & Answers:***

3.2.1. Phil Santos [FedEx Senior ATM Manager]: Ability to participate in FF-ICE as part of Future Concepts forum, it was clear that operators would need to make changes to flight planning systems. Has this been discussed in terms of next steps? Are the vendors in sync with the requirements?

3.2.1.1. Ray Ahlberg: FAA is making an investment in CSS Flight Data.

3.2.1.2. Ray Ahlberg: FF-ICE doesn't define application behavior just the data exchange, operators want to understand what will change (better priority, etc.).

3.2.1.3. Ray Ahlberg: Ops is where the initial outreach has been.

3.2.1.3.1. IATA at December had some workshops (US, Europe and Asia, in-person in Brussels), walkthrough the Ops. We need more engagement with the vendors to define provisions that are adequate for standardization and not overly prescriptive but fit for purpose.

3.2.1.4. FF-ICE and CSS-FD both need more outreach to developers.

3.2.1.5. Ray Ahlberg: Working on improving specifications and extensibility with XML.

3.2.1.5.1. *Josh Gustin: it's important to make sure we are testing because just using XML isn't bulletproof in ensuring extensibility*.

3.2.1.6. Josh Gustin: One thing we struggle with on SWIM is where does the value add to this? What are the timing aspects of this?

3.2.1.6.1. *Ray Ahlberg: Operationally, one would send flight data, then you see what affects you. Everyone has a baseline record for TFM, ATC, Airport Ops etc.*

3.2.1.6.2. *Ray Ahlberg: Technically, XML based format allows for folks can spec better data. Format extensibility allows and standard supports field 18 information designated flight plan items, to be maintained. We're trying to get to a place where everyone has the same amount of information*. *Technical carrots investigate the sensibility of this.*

3.2.1.6.3. *Josh: As for extensibility, FF-ICE changes need to be tested and confirm that things can be changed without breaking older systems. XML and any other software should facilitate this.*

4. SWIM Capability: SWIFT Portal (Damon Thomas – FAA, AJM-316)

4.2. **Audience Question:** When looking at portal, what's in it for me? What's the biggest gain?

4.2.1. Damon Thomas: The collaborative portion of the community. Not having to pick up the phone when the info is all right there. Improved collaboration without having to engage POCs, and learn what's available on SWIM.

5. **Special Topic: Widget Demonstration (SWIFT attendees from Day 1 – Joey Menzenski - MITRE)**
   5.2. **Audience Questions & Answers:** Phil Santos (FedEx Senior ATM Manager): Can we see real time airport throughput – if you can stretch out polygon boundary entry to gate can calculate the gate time?
   5.2.1. Joey: You could… by leveraging Uber H3 (geo-hashing polygons) – could calculate speeds – degradation of airport surface which may increase.
   5.3. Can you put this on jet routes like J6, to measure Airspace Flow Programs efficiency?
   5.3.1. Joey: Short answer yes you can place these on any location as long as geo graphical information is present
   5.3.1.1. David Almeida: Could be leveraged for De-icing application.
6. **Focus Group Summary (Ops Context, Analytics/Development, Operational) (Ray Mitchell, Chris Gottlieb, and Erin Cobbett)**
   6.2.1.1. **Audience Questions & Answers:** NASA Fuser merges data and selections elements will be open source… Take the mission into account getting SWIM is no longer issue, problem is what do I do with it, to create Data Sets… Maybe a good way for standard naming convention – terminology.
   6.2.1.1.1. Logic – no access to it… it's hard to understand how it is getting the data and what are the processes associated with the values that are presented (API – Widget etc.) How do I get to that place build on the ROI that was set out in the beginning (Replaced)?
   6.2.1.1.2. *Josh: If we can share back end things, we could make it quicker to jump forward via open sources – will help foster knowledge base.*
7. **Special Topic: Ops Context for TBFM (Xavier Pratt – LS Technologies)**
   7.2. **Audience Questions & Answers:** On TDFM time, we get random times, erroneous data, should we report the times?
   7.2.1. *Xavier: Part of update to come online. The erratic times should be fix in next update*.
   7.2.2. *Josh Gustin: Report back any updates or erroneous data. Happy to facilitate that conversation*.
8. **Special Topic: TBFM & Machine Learning (Al Capps - NASA)**
   8.2. **Audience Questions & Answers:** How are you ingesting the XML?
   8.2.1. Al Capps: Raw data XML we use Python and Beautiful Soup (python package).
   8.2.2. Why don't we just use the model from TDFM?
   8.2.2.1. Al Capps: TDFM has its own objectives and its goals were not the same as the airline operator needs, which is to predict runway clearance.
   8.2.3. Will you retrain the model?
   8.2.3.1. Al Capps: You train the model in post-op. You will need to retrain your model when new models come in.
   8.2.4. High TBFM Delay, how can we study it more?
   8.2.5. It may be a delay, but airlines can block it. It might not be a delay to them.
   8.2.6. How are you ingested data?
   8.2.6.1. Al Capps: Python "Beautiful" Soup python package Happens every night average by Zulu time to get the lowest message least likely to have issues matches.

8.2.7. Was time frame factor into TBFM and algorithms?

8.2.7.1. Al Capps: 3 hours was used for this example for learning model family (Container Class) -with a day ahead. All depends on what data is needed, Model is trained post ops, will need to train with updated data – maintainability wise if we have algorithms that update by running new data, they will stay up to date with a re-sync.

8.2.8. **Questions for the Community [Al Capps]**

8.2.8.1. Is model still useful to community, despite its wide variance?

8.2.8.2. Can we use data like this to better define what we mean by "high TBFM delay"? What/Who do we mean this?

8.2.8.2.1. American Airlines: High TBFM delay is important.

8.2.8.2.1.1. American Airlines: Model can be useful since there is there is high interest in industry over TBFM delay.

8.2.8.2.2. *American Airlines: Variance is also important from a block planning standpoint.*

8.2.8.2.2.1. Anything above 30 mins is considered high delay. But during GDPs, the TBFM/TFMS double restrictions are still an issue. Happens when the GDP is not delivering as planned.

8.2.8.3. Erin Cobbett: The data should indicate what is/define "high delay"?

8.2.8.3.1. MITRE: We started a study already and saw delay as high as 15 mins is considered "high".

9. Producer Program Briefing: SWIM Flight Data Publishing Service (SFDPS) – Ross Skiles

9.2. **Audience Questions & Answers:** how often is hold used?

9.2.1. Ross: *old message are in the data - not much holding that happens anymore.*