Minutes of the Federal Aviation Administration (FAA) SWIM Industry Collaboration Workshop – SWIM Industry-FAA Team (SWIFT) Meeting #6 Day 1 May 21, 2019 (8:30am – 4pm)

Southwest Airlines Wings Building
2195 Research Row
Dallas, Texas 75235

1. **Doors Open & Registration: 7:30am**
   1.1 The meeting was held at Southwest Airlines Wings Building, 2195 Research Row Dallas, Texas 75235 on Tuesday, May 21, 2019 at 8:30am.
   1.2 The sixth meeting of the Federal Aviation Administration (FAA) – SWIM Industry-FAA Team (SWIFT) was called to order by David Almeida, LS Technologies, SWIM SME and Strategist.
   1.3 Representatives from FAA, American Airlines, Delta Air Lines, Southwest Airlines, United, JetBlue, NASA, Jeppesen, NBAA, MITRE, Airlines for America (A4A), ARINCDirect, SeaTec, SaabSensis, Harris Corporation, Thales, LS Technologies, Noblis, Leidos, Metron Aviation, airlines, and the public attended. See Appendix A for more information about attendees.
2. **Introduction/Kickoff: 8:30am**
   2.1. Kickoff – Rick Dalton (Southwest Airlines), Craig Drew (Southwest Airlines), Dave Almeida (LS Technologies), Rob Goldman (Delta Air Lines), Josh Gustin (FAA), and Felisa White (FAA)
      2.1.1. Opening remarks; thank you and welcome
      2.1.2. Introduction of first time attendees
      2.1.3. Overview of agenda
         2.1.3.1. Focus on leveraging partnerships with the FAA to expand SWIM implementation within the industry
   2.2. SWIFT Update
      2.2.1. SWIM Roadmap
      2.2.2. SWIFT focus group status
         2.2.2.1. Request for additional engagement for involvement in the focus groups
      2.2.3. SWIFT Widget Case Study
         2.2.3.1. Potential Case Study – Compare ETDs/ETAs to actual arrival times using post ops analysis
      2.2.4. Special Topic: How Southwest Airlines is Structuring for SWIM
      2.2.5. Special Topic: Aeronautical Common Services (ACS)
      2.2.6. NBAA Case Study
      2.2.7. Traffic Flow Management System (TFMS): Program & SWIM Service Updates
      2.2.8. Special Topic: Enhance SWIM Cloud – Concepts & Use Cases
   2.3. Presentation of SWIM Planned Deployment Roadmap
      2.3.1. Looking ahead to 2020 and 2021

2.3.1.1. Doug Buckmaster (Southwest Airlines) – Working to update flight planning system; working with ATD-2

2.3.1.1.1. Working to get all these feeds built in by Fall 2019, then start building applications. Partnering with METRON.

2.3.2. Jay Zimmer (LS Technologies) reviews the operational context documents to date

2.3.2.1. Section 1 – Brief introduction of what the service is

2.3.2.2. Section 2 – More in-depth discussion of the domain

2.3.2.3. Section 3 – Explain how the system is reflected in information service itself

2.3.2.4. Section 4 – Contains the bulk of information; explains each individual data element and the syntax of how that message is shared

2.3.3. Marcus Lother (METRON) discusses the transition from using legacy TFMS to SWIM

2.3.3.1. Benefits of Slot Optimization

2.3.3.1.1. Less workload for slot coordination; improving compliance, getting business value out of the slot.

2.3.3.2. ADL Communications

2.3.3.2.1. In the future, we want to use all the SWIM data available to manage slots. FSM server and clients are the same, but now SWIM is the broker between TFMS and user.

2.3.3.2.2. We will use TFMS R/R to send/receive data to/from SWIM. Also, data from flight/flow to give things like flight lists, tracks, etc. and make that data available in a web client.

3. SWIM Widgets

3.1. Purpose of SWIM Widgets

3.2. Review of SWIFT Widget Site UPC code

3.3. Review of SWIM Flights times tables

3.3.1. Finding the difference between estimated time of departure and actual time of departure.

3.3.1.1. Demonstrates how you are able to see all flights landing/taking off at a given airport.

3.4. RAPT: How departure routes are affected by current weather.

3.4.1. All of that is data readily available right now.

3.5. The plan is to keep building widgets with a small team; finding another way to look at the same data set and make decisions based upon it.

3.6. IDRP – is a prototype tool that combines RAPT data with demand over routes themselves.

3.6.1. It is a true capacity demand predictor.

3.6.1.1. It is a needed tool – identified by the industry and FAA alike. The prototype has been around for 20 years.

4. Special Topic: How Southwest Airlines is Structuring for SWIM (Marcus Lowther and Rick Dalton, Southwest Airlines)

4.1. SWIM is more real-time, so there are possibilities within the system today.

4.1.1. Southwest Airlines has many opportunities to do many things with SWIM data.

4.2. How do you get to SWIM?
    4.2.1. Prove business cases internally, decompose, map back to information services available, and tie it back to FAA systems.
4.3. Relevant SWIM Data Elements
    4.3.1. How to compare to legacy tools – validating web client provides the same information as FSM.
    4.3.2. EDCT Times – working with SWIM; there was a filtering issue where they were restricted. They were supposed to be passed to CDM partners; this is currently waiting operational approval for the data release board.
4.4. Benefits of TFMS Request/Reply
    4.4.1. SWIM is more real-time with no 5-minute ADL batching.
        4.4.1.1. There are still some gaps in latency, but not as much as legacy.
        4.4.1.2. The chance of missing an available slot is less likely.

5. Special Topic: Aeronautical Common Services (ACS) (Bob McMullen, FAA)

5.1. NOTAMs
    5.1.1. SWIM rejects a percentage of NOTAMs due to schema issues.
        5.1.1.1. They are being fixed and the intent is to deploy in June.
        5.1.1.2. FNS-NDS to help filter how many NOTAMs you receive and the future enhancements.
5.2. AIMM
    5.2.1. The first phase was deployed a few years ago and now there are enhancements to the data.
        5.2.1.1. ACS is the central resource for receiving AIM information
    5.2.2. Phase 2 is dealing with ACS and delivering data in a new format over SWIM.
    5.2.3. Looking ahead, once ACS is deployed and airlines are consuming, how can we enhance existing services?
5.3. ACS Data Sources and Web Services
    5.3.1. The data comes out every 56 days, but now you can get that data whenever you need to, SAA, etc.
    5.3.2. The goal is to go to one place to get the Aeronautical information
5.4. ACT
    5.4.1. The testbed will be available in September 2019.
        5.4.1.1. You will need to on-board to SWIM and R&D to use ACS.
    5.4.2. In March 2020 there will be live data to view to make sure the data is still coming through correctly once its available.
5.5. ACT/ACS On-Boarding
    5.5.1. We are working closely with the SWIM PO to make sure customers get on-boarded.
        5.5.1.1. It usually takes 4-6 months for everyone to on-board.

6. NBAA Case Study: Refining Airspace Restrictions with SWIM (Ernie Stellings, NBAA)

6.1. Users were unable to see flights plans on FSM due to late filing.
    6.1.1. They worked with flight planning companies so now flights are more accurate in FSM.

6.2. Review of Use Case with issues with overflights caught in AFPs and how to use SWIM data to pinpoint these issues and how prevalent the problems are.
  6.2.1. This problem resonates with major carriers.
    6.2.1.1. The industry works with AFPs in general, but there is a lack of data around rate setting.
    6.2.1.2. Any progression on rate setting will require better data or a more stable data set.
      6.2.1.2.1. SWIM is a source for better data; it can be more stable if managed properly.
6.3. Discussion of the MITRE app and how to apply data.
  6.3.1. They are working at KCLT to allow surface CDM data.
    6.3.1.1. There is still work to be done with the tech transfer, but it is very promising.
  6.3.2. The values we are seeing at KCLT from GA for EOBT is just as good as what we are seeing with major carriers.
    6.3.2.1. The data quality is high. The trick is to incentivize information back to make it worth their while to provide the data and have methodology on the backend.

7. Traffic Flow Management System (TFMS): Program & SWIM Service Updates (Chris Burdick)

7.1. TFMS is improving efficiency for the greater National Airspace System (NAS).
  7.1.1. TFMS R14 is the next build in support of TFDM.
7.2. Just for Tracons, AUs can request directly from TFDM.
  7.2.1. The new schema coming out for TFMS 3.0 will be discussed at the monthly telecons.
7.3. When will this be on R&D?
  7.3.1. We are not sure yet, but it will be on R&D and Dev before Ops.
  7.3.2. Maybe in the future we will look at providing two separate TFMS schema to handle more rapid updates.
7.4. PDRR/ABRR Updates
  7.4.1. Deployment will take place around October 2020.
    7.4.1.1. Still a constraint around TFDM/TFMS Tech Refresh.
    7.4.1.2. The surface viewer is built on that new hardware.
7.5. R15/16
  7.5.1. Will migration be required?
    7.5.1.1. There are no planned changes to TFMData schema. There may be some slots put in there for problem changes that may not be schema changes.
    7.5.1.2. The user impact would be an outage during maintenance/rollout but no development on user side identified.
  7.5.2. How do you decide what parts get included in the SWIM output/interface?
    7.5.2.1. Not sure about that process; some come through CDM requests
      7.5.2.1.1. NAC NIWG have done that too.
7.6. When will SWIM 2C be implemented?

7.6.1. There were supposed to be improvements to NEMS nodes to enable CSS-Wx. Could there be issues getting this weather information to TFMS?
7.6.1.1. There is no risk, but we are a little behind.
7.6.1.1.1. FID will be in December 2019. NEMS node updates will take place ahead of this.

7.7. Flight Data
7.7.1. FlightControl will be shared with CDM participants once the NAS Review Board approves the change to restricted messages.
7.7.1.1. Is there a list of what is restricted?
7.7.1.2. We want to be able to know what is and is not going into SWIM. Not sure how to request something if we don't know if it is being produced.
7.7.1.2.1. Restricted only military, VIP really in terms of what goes to CDM.
7.7.1.2.2. If it is published on SWIM, it's only restricted if the CDM MOA says I can't give it you. For things in systems not published, that would have to come out of the CDM WG.
7.7.1.3. TFMData was built out of data processed at our hub site. TSD and FSM do a lot of raw data processing. We process that in our application, but you can't get that value in SWIM, since TSD and FSM are decentralized.
7.7.2. Are the TSD/FSM algorithms published anywhere?
7.7.2.1. No, it's in the system design documents which are not public.
7.7.2.1.1. It would be good to have everyone on the same page – demand is not included in any message; it would be helpful if it was provided.
7.7.2.1.1.1. Can we include a column that explains what the replies look like in the Ops Context document?
7.7.2.1.1.1.1. Yes, if the community wants it.

7.8. TFMS Status
7.8.1. No output of what this message looks like.
7.8.1.1. A sample of data should be on NSRR, but we will put it on there if it's not already.
7.8.2. Webinars are really valuable, especially during transition.
7.8.2.1. There is a restriction for APREQ missing, will that be fixed in R14?
7.8.2.1.1. Need to verify, but I think so.
7.8.2.2. No new data to be added, but small changes on the backend can save people time processing data.
7.8.2.3. TBFM release time is on FSM, but on the data feed that comes from TFM, no descriptor that there is now an APREQ.
7.8.2.4. Other things on TBFM side, like release time, we are spending a lot of money to see how much delay is being propagated back.
7.8.2.4.1. If everyone had that one data element, everyone could save money.
7.8.2.4.2. CDM meetings aren't driven by that kind of data. If these data elements are valuable to the community, the governance process could take advantage of that.

7.8.2.5. This has come up on multiple occasions. How can the SWIFT begin to influence producers in what they put in their services?

7.8.2.5.1. Provenance of data; now talking about the convenience of data.

7.8.2.5.1.1. Accuracy, if that data comes from TFM, and they are updating their ETDs based on TBFM, users will have the SWIM feed available to update their times.

7.8.2.5.1.2. If users have systems that leverage 3T data, we need to find a way to leverage those systems.

8. SWIM Global Strategy (Diana Liang, NextGen)

8.1. Global challenges: Our community has already bought in; cost challenges when replacing existing interfaces.

8.2. Objective: SWIM is the global backbone for sharing.

8.3. Benefits: The IT community sees cost savings from all the connections

8.3.1. What is the operational benefit?

8.3.1.1. SWIM benefits are at a global/regional level.

8.3.1.2. The increased information will help with sharing of low and operational outcomes.

8.3.1.3. Many countries are just coming up and want to apply our lessons learned to them. Globally we need to go to SWIM.

8.4. SWIM GIF: Technical Infrastructure, Exchange Models, Information Services.

8.5. SWIM Core services: Service Security, Interface Management, Messaging, Enterprise Service Management.

8.6. Security Service: FAA has many security layers – VPN, authentication, etc.

8.6.1. Aviation is global; ICAO is looking at a network for aviation community.

8.6.1.1. Trusted, secure, resilient.

8.6.2. Common standards/procedures to enable different regions, geopolitical constraints, to make sure we can have a trusted network.

8.6.2.1. Growing activity in terms of its importance.

8.7. The complex conversations at ICAO are amazing – we revisit topics often.

8.7.1. Standards are constantly changing.

8.7.2. AMQP 1.0 got standardized in 2016.

8.7.3. Industry takes time to establish standards. Sometimes these standards change after investments are made.

8.7.3.1. If we can define at each layer of technology, then you can speak to what interoperability means. You need to pick the right standards to make sure you are interoperable from the application to the network.

8.7.3.1.1. Include governance and security in addition to monitoring.

8.8. Global activities: GANP includes a thread on minimum standards to ensure interoperability.

8.8.1. Some of the world is sitting back and waiting to see what ICAO requires them to do.

8.8.1.1. Provisions (international should/shall on SWIM) are being developed, implementation guidance, SWIM Manual.

8.9. ICAO Information Services: ICAO MET panel, responsible for meteorological services, pushing data in IWXXM format, targeting 2020 for some of MET services to be IWXXM compliant.
  8.9.1. ATMRPP – developing Flight and Flow Information for a Collaborative Environment (FF-ICE).
  8.9.2. IMP ensures we can share information using AIXM.
8.10. ICAO will not make changes quickly; there will be a few years where we would have transition.
  8.10.1. Now we have draft provisions/guidance, but it's going through the FAA LOBs and anyone that is affected by the change can review and comment on the changes.
  8.10.2. We take a different look than EUROCONTROL to keep flexibility in the standards because we want options.
    8.10.2.1. We engage in the regions to help them also. We make sure nothing is put in that will break what we do in the FAA. Our job is to make sure people trying to implement don't restrict us.
  8.10.3. IATA is represented on these panels and members who rely on that relationship should make sure your interests are echoed there.
  8.10.4. Aerospace vendors are also members of AIA. As consumers as them what they are doing to influence international activities.
    8.10.4.1. These are serious consequential changes to your systems.
    8.10.4.2. Interoperability is an alignment of standards across every layer of technology.
8.11. Regional Activities: SWIM does not help regional partners until you start working with them.
  8.11.1. Mini Global demos in 2015 helped the community understand you could have multiple SWIM vendors as long as we ensure interoperability.
  8.11.2. Multiple partners using different vendors can still exchange information.
    8.11.2.1. Worked with all these ANSPs and showed them how to stand up SWIM infrastructure then showed them how to do the interfaces and how to exchange information. Then built operational scenarios that resonated with their regions to highlight what SWIM can do.
8.12. ASEAN nations started to identify ATFM sharing by fax/email and wanted to get region educated and comfortable with SWIM.
  8.12.1. They started a demo in the region; FAA is working with ASEAN for a SWIM demo.
    8.12.1.1. The demo is targeted for November 2019.
8.13. Implementation: APAC SWIM TF
  8.13.1. Focused on implementation of SWIM in the Asia region.
  8.13.2. Multiple topics – how to make a registry for the region?
    8.13.2.1. We want them to tell us their roadmap and they are challenged with what the operational need for SWIM is.
      8.13.2.1.1. Some say FF-ICE, some say TFM.
8.14. CADENA: CANSO TFM data exchange in the Americas.
  8.14.1. Started in 2016.

8.14.2. In 2017 Trinidad was able to share SWIM data to FAA to let TFMS ingest that data and manage flow.

8.14.3. 2023-2024 timeframe for APAC region. Europe has deployed some SWIM services.

8.14.4. What does governance look like for global SWIM?

8.14.4.1. Our strategy is to start with what we have and go from there.

8.14.4.2. We require that you have to have a registry, it has to have a service overview, what goes in that service overview. We pushed hard in terms of QoS to describe in service overview.

8.14.4.3. It translates down to how you want operations to work. If you are in a country talking to a registry, the registries should interoperate, so you know where to go.

8.14.4.4. Filing a flight plan – you know where to do it and when. In an interoperable world that should be passed along.

9. Update on SCDS (Felisa White, FAA)

9.1. Looking to deploy SCDS in June 2019.

9.1.1. This is the first NAS data in the cloud for non-operational use.

9.1.1.1. Good for analysis, research, etc.

9.1.2. We talked to marketing and asked how Google can record our delay codes before they are published to the customers.

9.1.2.1. We want to communicate to our users before Google does.

9.1.3. The barrier to entry is reduced, but all this data is publicly available.

9.1.3.1. There is a huge benefit in the reduction of on-boarding time.

9.1.3.1.1. Handling these many requests becomes an issue.

9.2. SCDS was developed to address the open data policy law that says we have to make this data available.

9.2.1. Users will want to be on the cloud, due to things available on AWS/Google that will never be on NESG.

9.3. If we start getting calls about SCDS we did something wrong – we want people to understand how to do this on their own.

9.3.1. The self-service module is where we want to make sure we hit the mark.

9.4. SCDS allows us to modify the behavior of how you get data.

9.4.1. You can selectively group data for what you want.

10. Enhanced SWIM Cloud Service (ESCS)

10.1. SWIM is empowerment to the users. This conversation will help lead to development activities to bring it into the next century.

10.1.1. Airspace User operational functionality, Web services, enhanced R&D to include SWIM cloud.

10.2. SWIFT Attendees provided inputs as to what sort of enhancements they would like to see in ESCS. These suggested enhancements are included below and will be considered by the FAA and cross referenced against other inputs to determine most applicable needs across the communities the FAA serves.

10.3. Capability enhancements: Data rewind – if you have an outage, you can select the timeframe you want, and it sends it back to your systems.

10.4. The business case for SWIM is infrastructure-oriented.

10.4.1. Those business cases are hard to make, but if you cut off the network, it's a huge problem. SWIM creates new service opportunities for the community.

10.5. Dashboard for SWIM help

10.5.1. NCR – finalizing the capability scheduled to come out next year. Some feeds from already developed services (weather, TFMS, NOTAMS) put in a request for information in a certain airspace area. Gives you back NOTAMS, weather, etc. that apply.

10.5.2. It can be a subscription query or one-off. It is active data query.

10.6. SWIFT Portal: want to craft user experience around your role – IT, Ops, Data scientist, etc.

10.6.1. Enable the community to exchange ideas, code, what they have learned, service behavior, how algorithms work and change outcomes.

11. Closeout

11.1. Tomorrow will be much more technical.

11.1.1. We will talk through mediated data from different flight services.

11.1.1.1. We had a need to understand this data.

11.1.1.2. Lots of lessons learned.

11.1.1.2.1. Our desire is to transfer this knowledge to the community.

Appendix A: SWIM Industry - FAA Team (SWIFT) Meeting #6 Attendees – May 21, 2019

David Almeida, LST	Richard Barton, Solace	Michael Beck, United
Matthew Bellinger, SaabSensis	Joe Bertapelle, JetBlue	Kristen Beverly, LST
Steve Bradford, FAA	Chris Brinton, NASA	Lee Brown
David Brukman, Passur	Chris Burdick	Vicki Burford, American Airlines
Jason Burke, NASA	Stefanie Calabrese, Noblis	Al Capps, NASA
Ted Carniol	Andrew Churchhill, NASA	Erin Cobbett, Delta Air Lines
Eli Cohen	William Coupe, NASA	Kathy Crandall
William Cranor	Kathryn Crispin, American Airlines	Daniel Criswell
Rick Dalton, Southwest Airlines	Claudia Davidson, Palantir	Adam Davis
Michelle Davis	Kent Duffy, FAA	Shouvik Dutta
Dave Emmons, American Airlines	Shawn Engelland	Paul Finn
Mark Galyen, American Airlines	Kenneth Gochenour, Jeppesen	Rob Goldman, Delta Air Lines
Shawn Gorman, MosaicATM	Thomas Green, Rockwell Collins	Daniel Greenbaum
Joshua Gustin, FAA	Douglas Harvey	Shawn Herron, LST
Rory Hight	Rose Hsu	Mindy Howard
Michael Huffman, FAA	Ilhan Ince, Passur	Michael Jagmin, United
Kevin Johle	Brett Jones, Atlas Air	Roger Jones
Suzanne Koppanen	Dennis Krisczy, FAA	Rafal Kicinger
Connor Landy, Palantir	Jefferey Lascola	Diana Liang, FAA
Dan London	Justin Lonie	Marcus Lowther, Metron Aviation
Dan Lyons	Eugene Maina	Ryan Makings
Cynthia Marzette	Scott Masarky	Melissa Matthews, FAA
Eric Mayne	Brian McGill	Robert McMullen
Greg Meadows, Red Cloud Services	Teresa Mendes, Noblis	Alex Murray, Noblis
Tim Niznik, American Airlines	Frank Oley, Airlines for America (A4A)	Susan Pfingstler, United
N Rawal	Isaac Robeson, NASA	Bob Richard
Cheryl Romano	John Schade	John Short
Garrison Smith, Delta Air Lines	Kwangil Sohn	Sandra Steele, American Airlines
Ernie Stellings, National Business Aviation Association (NBAA)	James Tauss, HSI	Jamie Terrell, American Airlines
Dan Torres	Sarasina Tuchen, NASA	Bill Tuck
Steve Turner	Eric Van Brunt, Leidos	Robert Vandusen
Unni Vellanikaran, SeaTec	Himanshu Verma	Felisa White, FAA
David Wickes	Stuart Wilson, NASA	Doug Woehler
Tak Wong, AlaskaAir	Kevin Witzberger, NASA	Pengcheng Zhang, American Airlines
Jay Zimmer, LST		