



Global SWIM: The Future of Global Data Convergence

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GM & Strategy – SkyFusion – Critical Networks

- Decade of Aviation Communications and Information Management Experience
- MBA from Duke Fuqua School of Business with a concentration in strategy
- General Manager for SkyFusion project



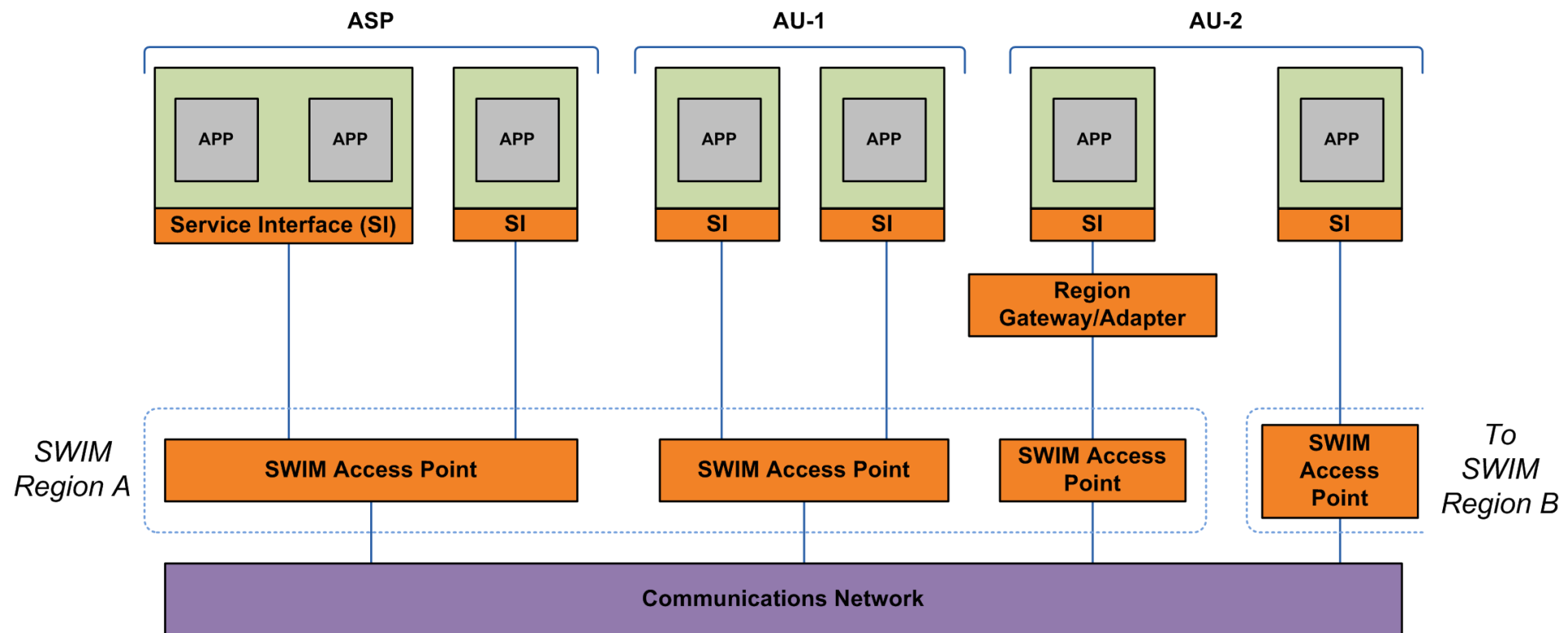
Stuart Wilson, Harris Corporation

Advanced Programs Engineer – SWIM – Critical Networks

- Subject matter expert on aviation data integration
- M.S. in Applied Aviation Safety from Florida Institute of Technology with an emphasis on Flight Training Operations
- ICAO Information Management Panel Technical Advisor to IATA on the implementation of Information Services



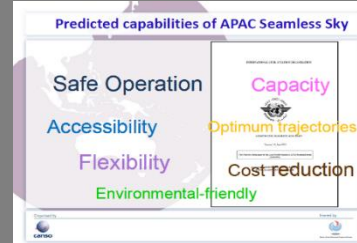
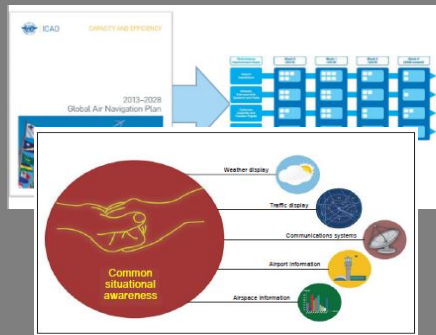
ICAO Global SWIM Concept



ICAO DOC 10039 "Manual on System Wide Information Management (SWIM) Concept"
Figure 5. Illustration of Enterprises and SWIM Region

Next Step: Data Convergence

Global and Regional Goals



Stakeholder Surveys, Feedback, and Discussions



Airline



ANSP



Airport

Convergence on needs for ATFM/CDM and SWIM

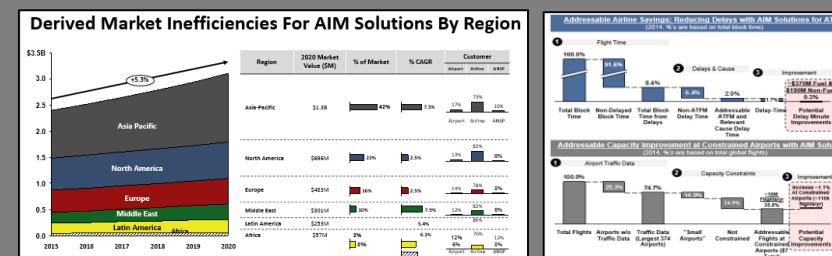
Industry Studies (ICAO, IATA, Airbus, Boeing, etc.)

Table A: Regional passenger traffic and capacity growth, market shares and load factors in 2013*

Region	International		Domestic		Total		ASG Capacity Growth	LFS Load Factor
	Traffic Growth	Market Share	Traffic Growth	Market Share	Traffic Growth	Market Share		
Africa	7.4%	3%	4.2%	1%	7.0%	2%	5.2%	69.6%
Asia and Pacific	5.2%	27%	9.6%	37%	7.2%	31%	6.7%	77.2%
Europe	3.5%	38%	3.7%	8%	3.8%	27%	2.6%	79.9%
Latin America and the Caribbean	8.5%	4%	4.2%	7%	6.3%	5%	5.0%	76.1%
Middle East	10.9%	13%	16.1%	1%	11.2%	9%	11.5%	76.9%
North America	6.2%	14%	1.9%	46%	2.2%	26%	1.9%	83.0%
World	5.2%	100%	5.1%	100%	5.2%	100%	4.6%	79.1%

* These figures are preliminary and cover scheduled commercial services only. The statistics are applicable to the traffic by region of airline domicile.

Harris and IATA Quantitative Research



Key Regional Information Sharing Challenges & Opportunities



Data access and exchange across regional Air Navigation Service Providers (ANSPs), Airlines, and Airports is insufficient

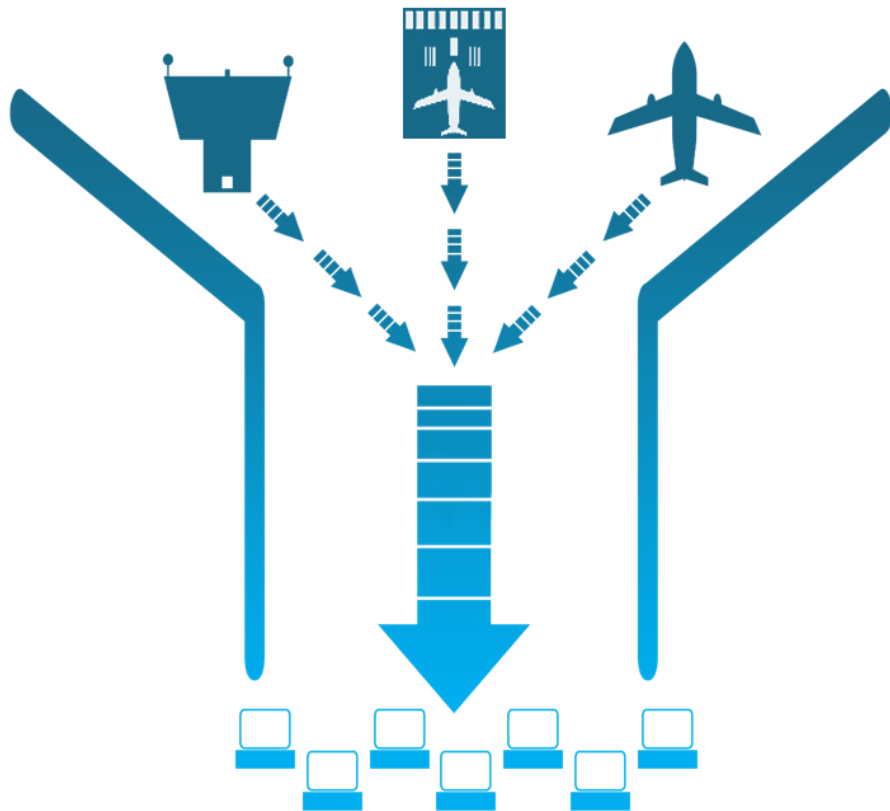


Need for Collaborative Decision Making (CDM) process, tools, improved situational awareness, and training across regional Air Traffic Management (ATM) stakeholders



Opportunity for new architectures to enable operational goals

Operations of Tomorrow



Airlines

- Meeting the needs of fleet management
- Exceeding passenger expectations, domestic and across borders
- Relying on technology to help reduce cost and increase safety

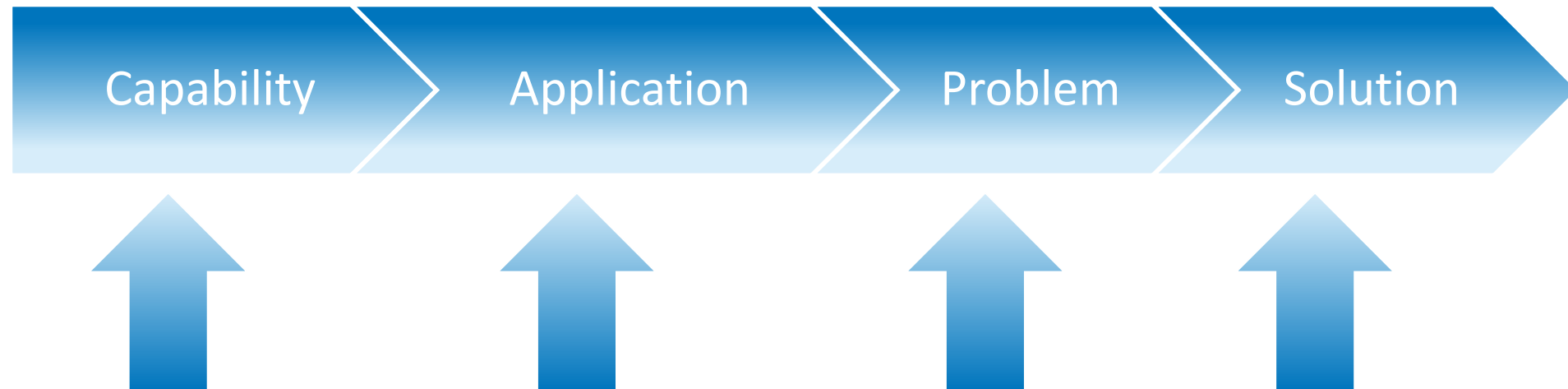
Air Navigation Service Providers (ANSPs)

- Utilizing safe, reliable airspace for air transportation of people and cargo
- Helping manage international regulation
- Maintaining infrastructure to better facilitate Air Traffic Management (ATM)

Airports

- Managing arrivals and departures both domestically and internationally
- Providing constant-on-site situational awareness for aviation stakeholders
- Facilitating and implementing upgrades to airport infrastructure to guarantee passenger and property safety

SWIM: From Capability to Solution



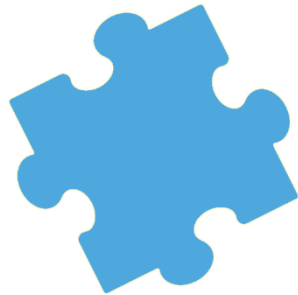
Enabling sharing of information through data standards in order to achieve system to system data exchange

SWIM Helps: Enabling Technology + Innovation



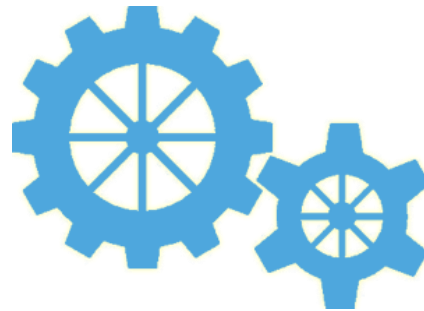
Cloud

- Efficient scaling of services and infrastructure
- No upfront infrastructure cost
- Pay for what you use



Business Intelligence

- Increased understanding of operational inefficiencies
- Real-time alerting on key indicators



Automation

- Reduced complexity of infrastructure provisioning
- Reduction of operational man hours required



Machine Learning

- Deep dive into large amounts of data
- Recognition of new patterns and key indicators



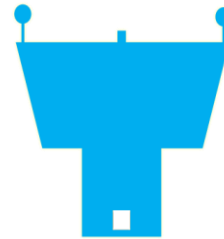
Internet of Things

- Diverse sets of information from varying sources
- Increased data set fidelity

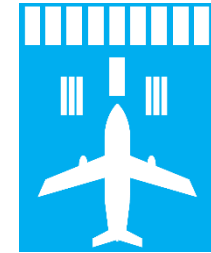
SWIM Enables....



- Improves situational awareness at home and abroad
- Provides tools for collaboration across borders
- Supports enhanced decision making
- Serves to link airlines with ATM network via SWIM-enabled information network

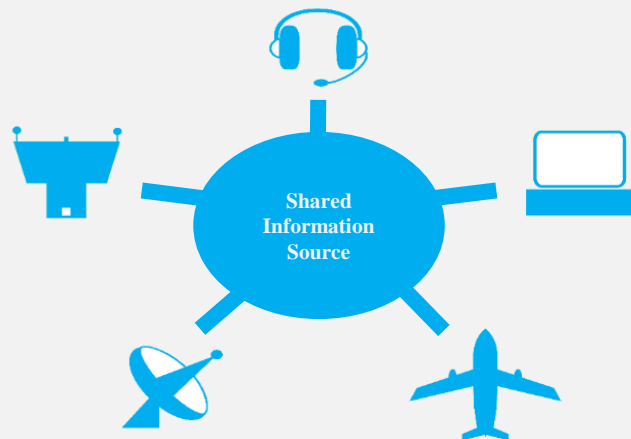


- Create Information and tools that complement existing decision support systems
- Enables common situational awareness, and effective dialogue between stakeholders
- Future-proofs ATM systems



- Improves situational awareness unconstrained by borders
- Provides collaboration tool
- Provides a means to interconnect Airport CDM system via ATM network

SWIM Benefits : Air Traffic Flow Management (ATFM)



- ✓ SWIM can enable data for command center function to enhance CDM capabilities
- ✓ Information that provides situational awareness to users on impacts



- ✓ Reduction of holding can save airlines as much as 71 USD per minute avoided

**source ACI study delay minute 2014*

SWIM Benefits : Empowering Decisions



- ✓ 95% Passengers are Happiest in Dwelling Time



- ✓ #1 thing passengers demand is accurate information



- ✓ Happy passengers spend 45% more



- ✓ Revenue enhancement of \$10 Average opportunity during delay which has been accurately communicated to passengers

**95% source SITA 2015 IT report, 45% JD Power Study, #1 surveyed disruption*

How SWIM supports ATM efficiency :

Recent Demonstrations



Mini Global II Demonstration

- Led by the FAA,
- Showcased the ability to connect multiple ANSPs, airlines, and third party apps



SESAR Global SWIM Demonstration

- Led by SESAR
- Highlights the ability of ANSPs to integrate with the SESAR SWIM architecture.



SWIM Master Class

- Annual event enables industry to come together and jointly
- Develop advanced SWIM capabilities in a collaborative environment



Let's move from demonstration and theory to
a
real operational example

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SkyFusion





Why IATA & Harris?



Non-biased, not for profit with an interest for the aviation community at large

Provides support for both regional and globally cost effective goals

Global infrastructure and a knowledge across multiple aviation stakeholders



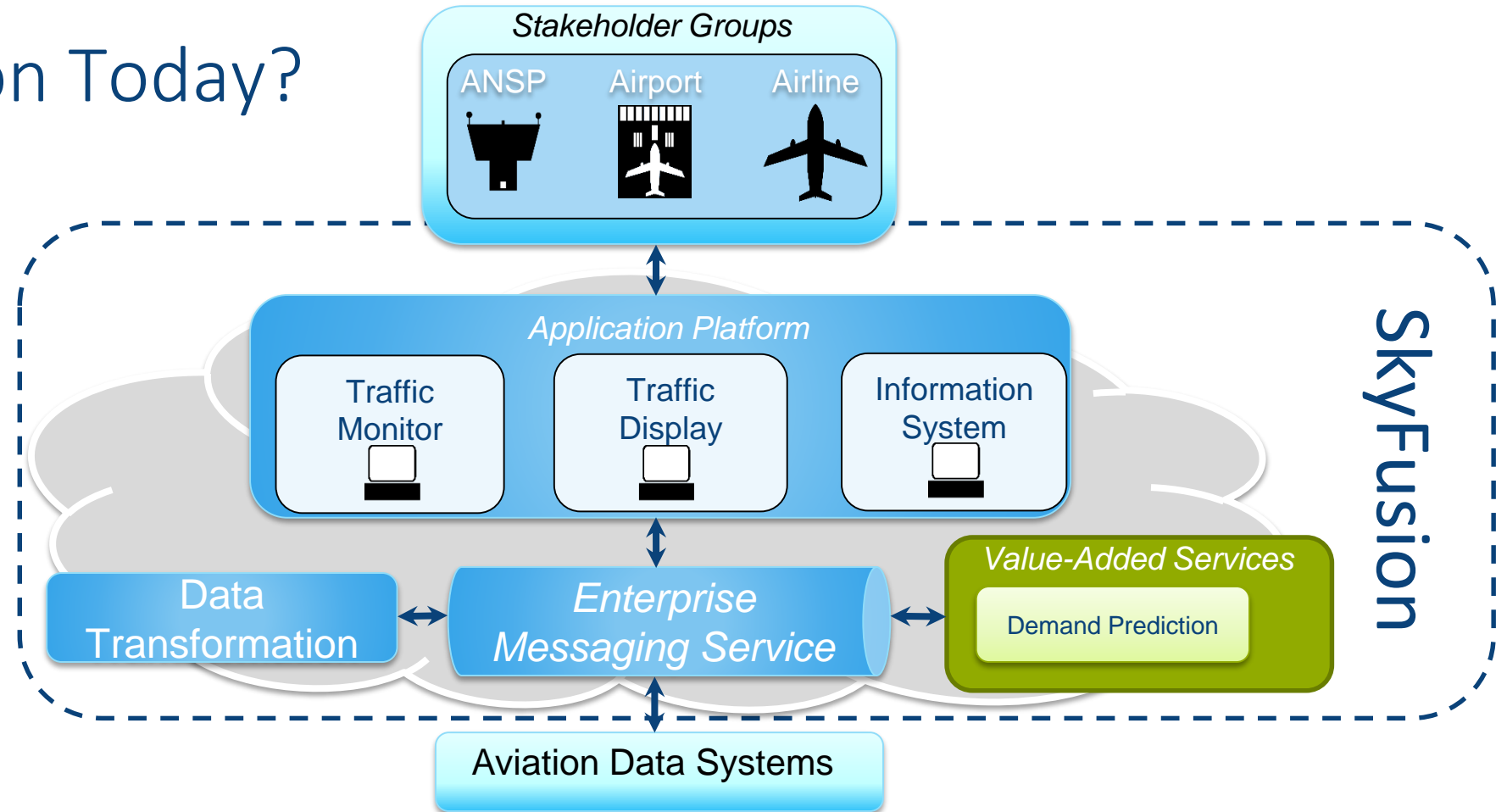
SWIM Solution specialists involving FAA, Sesar Joint Undertaking, Mini-Global

Global leader in SWIM implementation, infrastructure, and data

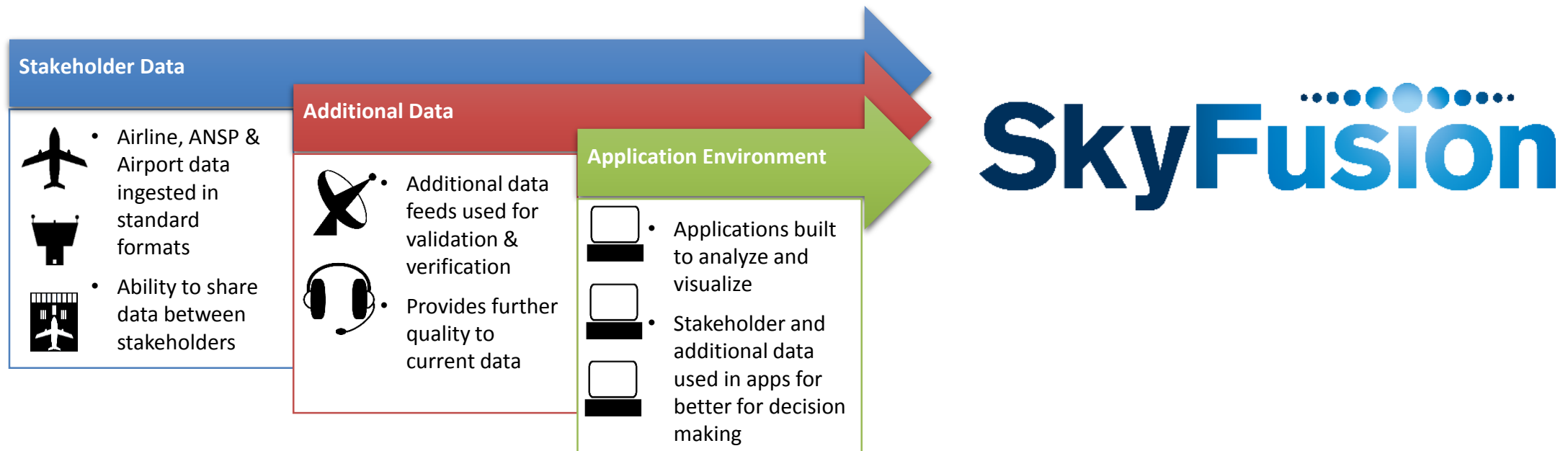
Worldwide data validation and efficiency solving applications such as Orthogon Osyrus

What is SkyFusion Today?

- Data Exchange Platform
- Application Framework
- Situational Awareness Tools & Beyond



How SkyFusion Works



SkyFusion Benefits



Summation

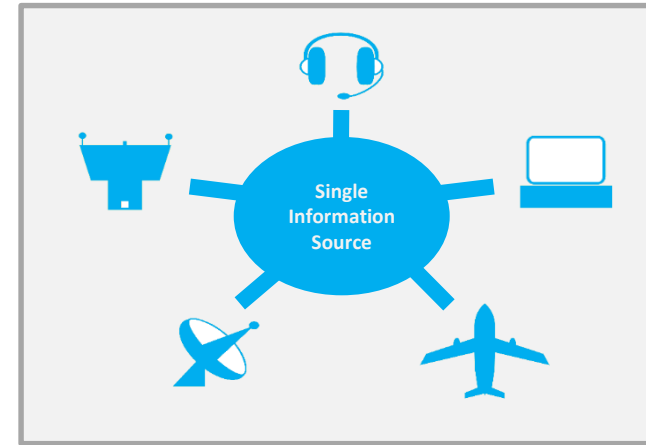
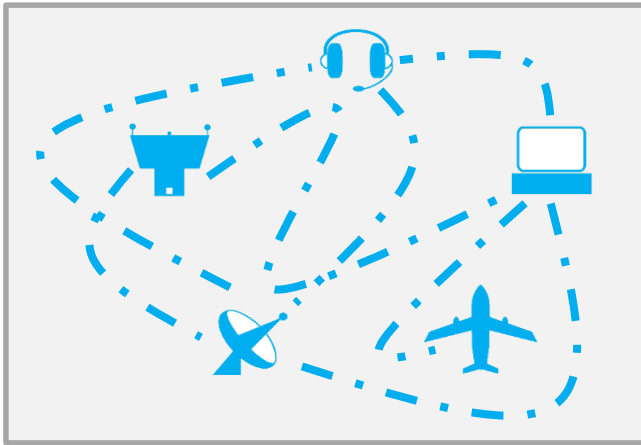
Today we have

- Touched on the need for data convergence
- Discussed market growth and technology trends
- Learned about SWIM – what it is and what it enables
- Provided an overview of specific cases where information sharing is essential
- Addressed data sharing today
- Provided an example of an operational service further supports integration of SWIM and CDM
- Introduced SkyFusion

Thank you so much for your time and feedback!



BACKUP



1. **Problem:** Multiple and potentially conflicting information sources
2. Point-to-point system connections
3. Limited data sharing and isolated decision-making
4. Inability to see the broader picture and decision implications

1. **Solution:** A single information source for data and application needs
2. A single, integrated connection (SWIM)
3. Open data sharing and collaborative decision making opportunities
4. Holistic view of operations between multiple stakeholder groups