

Global Harmonization Through Collaboration

Emerging Trends

Presented By: Barry C Davis

Date: 28 August 2012



**Federal Aviation
Administration**

**AIR TRANSPORTATION INFORMATION
EXCHANGE CONFERENCE - (FEATURING
AIXM, WXXM AND FIXM)**

August 28, 2012 - August 31, 2012
NOAA Auditorium and Science Center
Silver Spring, Maryland

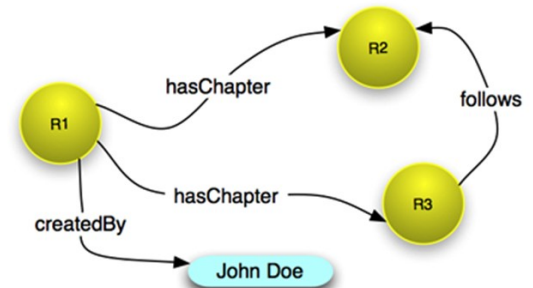


Discussion



Air Transportation Information
Exchange Conference - (featuring
AIXM, WXXM and FIXM)

- Information of the Future
- Analog and Digital
- Operations of the Future
- Performance-based Information Management

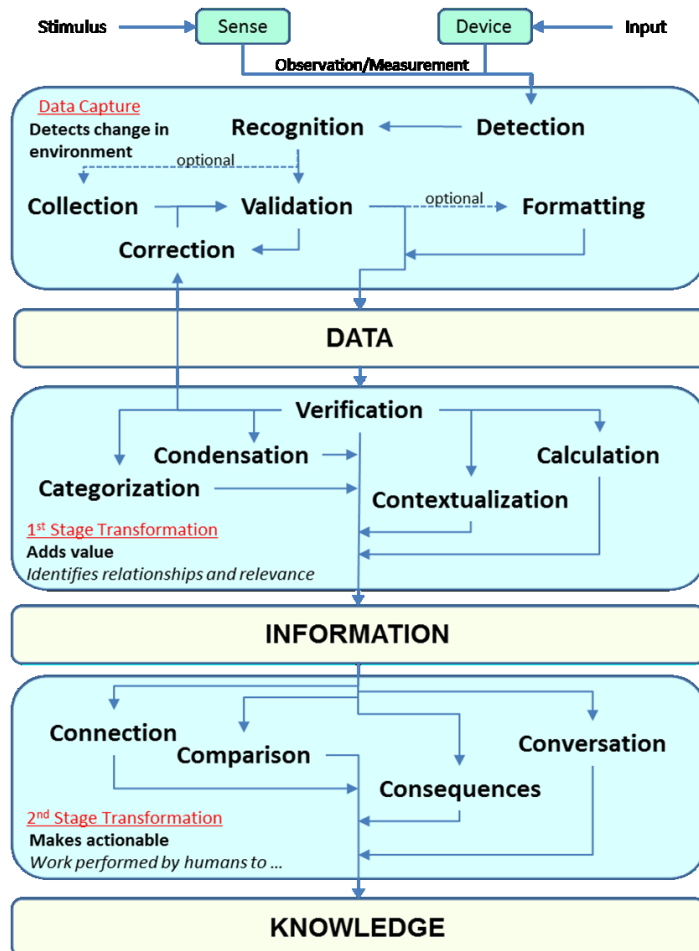


Subject	Predicate	Object
R1	hasChapter	R2
R1	hasChapter	R3
R3	follows	R2
R1	createdBy	"John Doe"

Information Expansion

INFORMATION OF THE FUTURE

Information



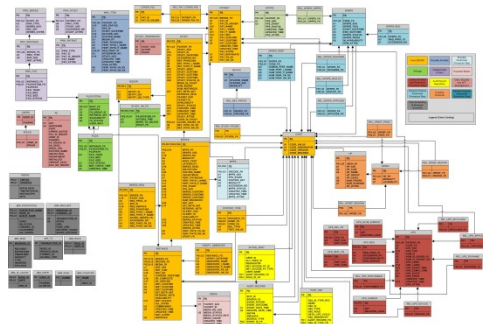
- Data vs Information
 - Context
- Digital vs Analog
 - View
- Digital vs Electronic
 - Transport

Data Organization

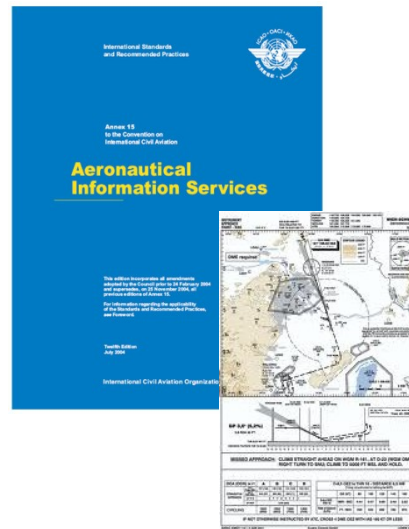


Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)

Structured Data
(30%)



Semi-Structured Data (25%)

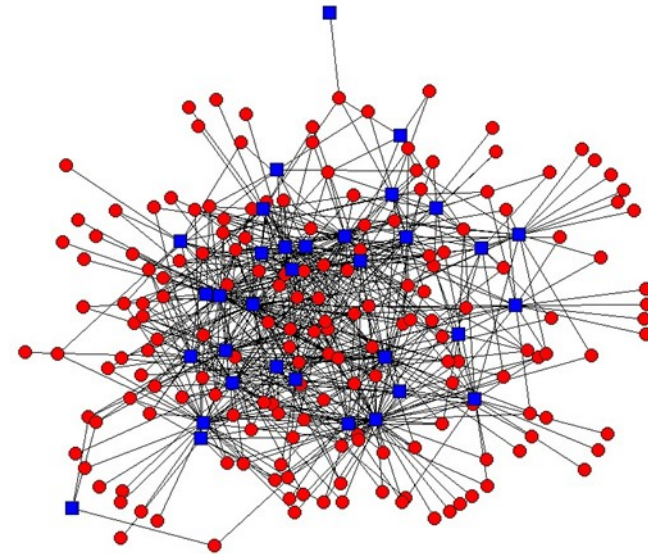
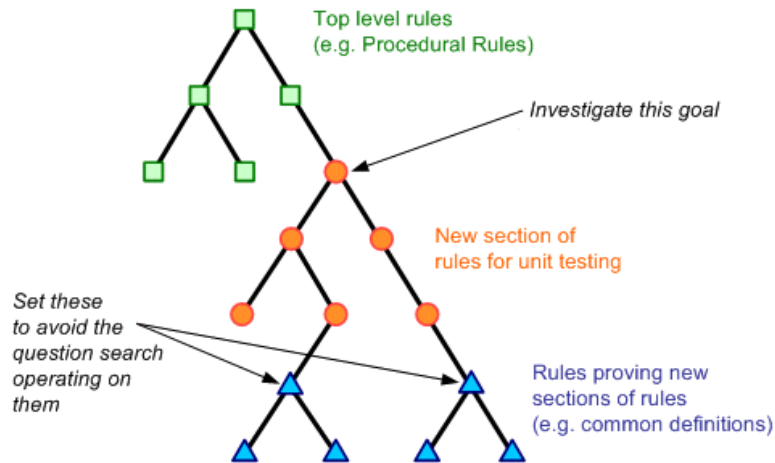


Unstructured Data (45%)



Source of percentages: http://www.allianza.com.au/pdf/Discovery_paper_Brief.pdf

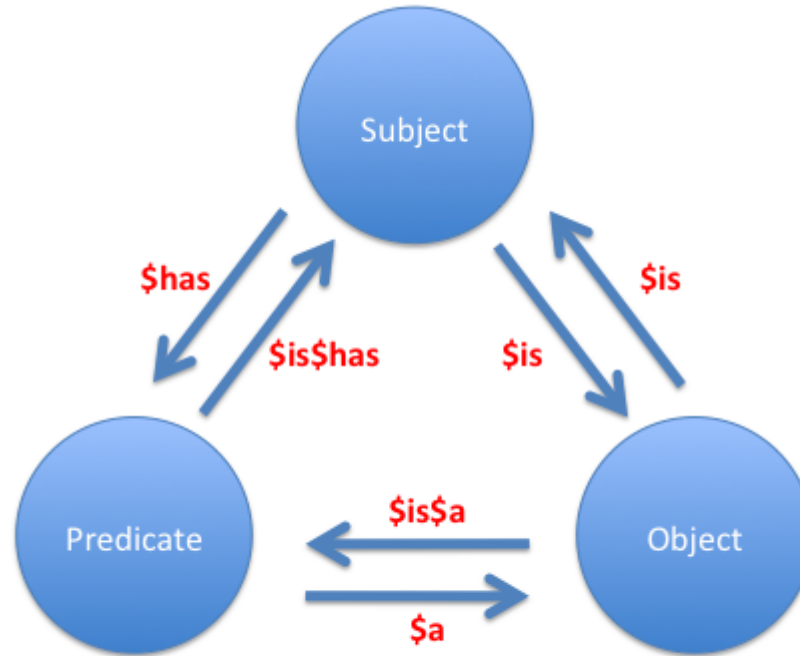
More data



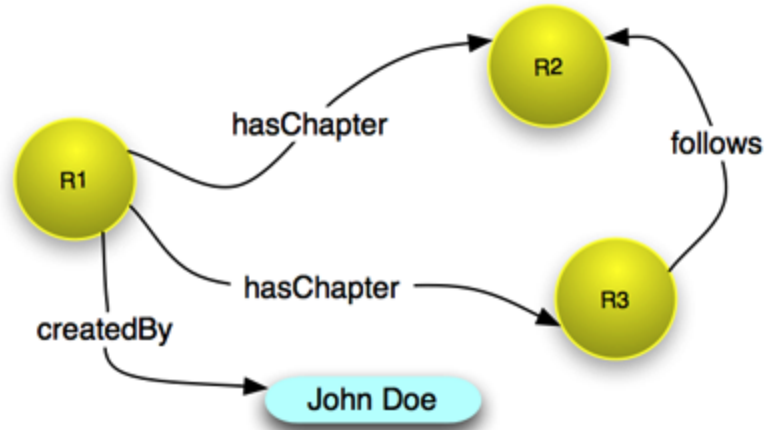
- Rule base
 - Security
 - Data Validation
 - Workflow
 - Formatting

- Semantic
 - Ontology (Relationships)
 - Taxonomy (Grouping)

Triples

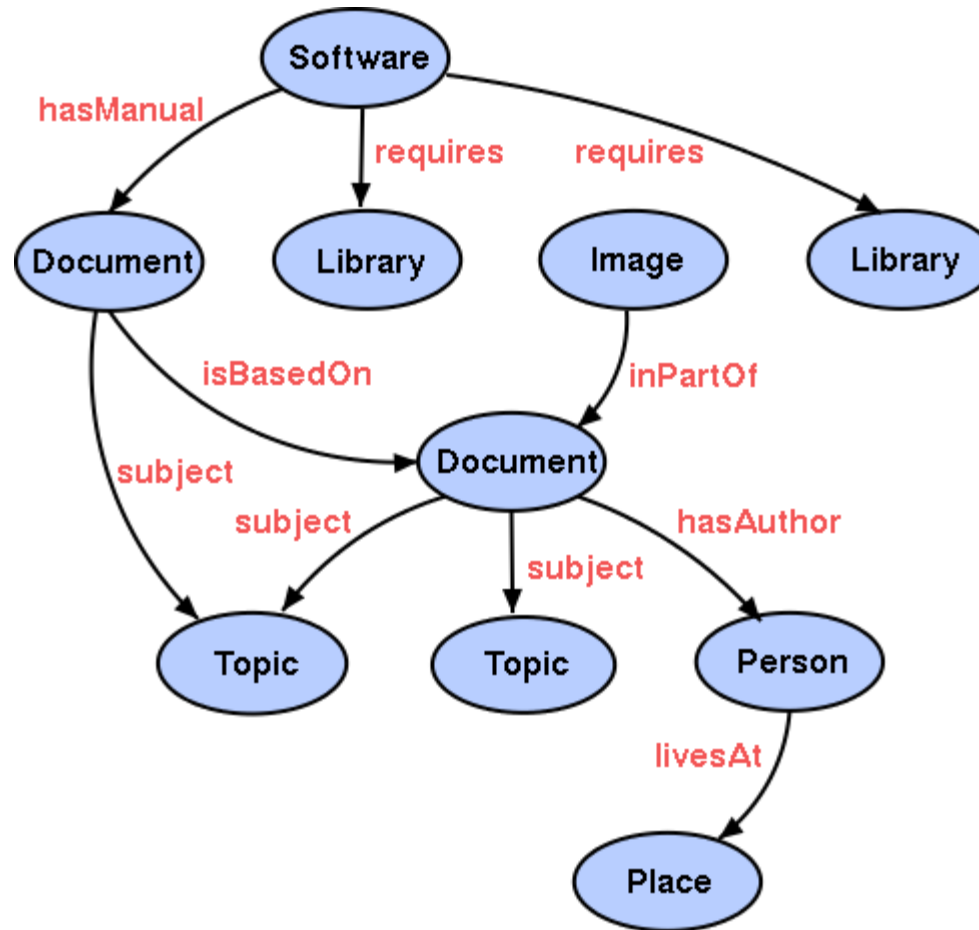


Triples Example

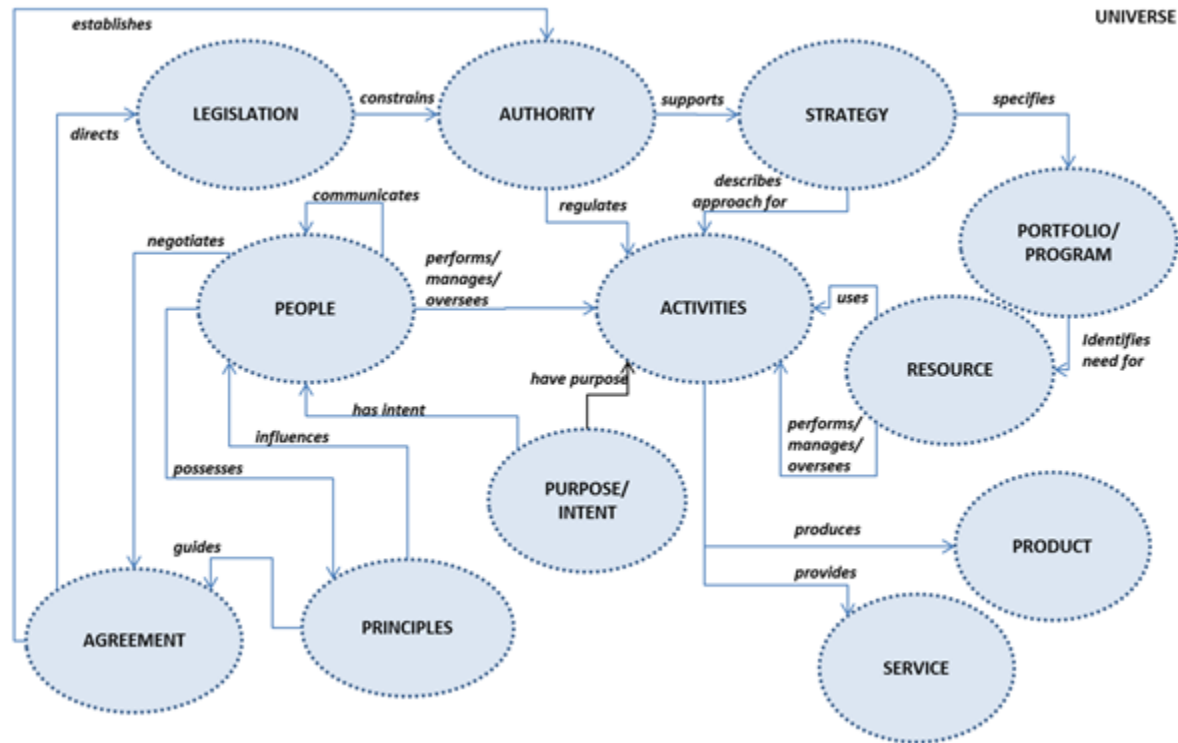


Subject	Predicate	Object
R1	hasChapter	R2
R1	hasChapter	R3
R3	follows	R2
R1	createdBy	"John Doe"

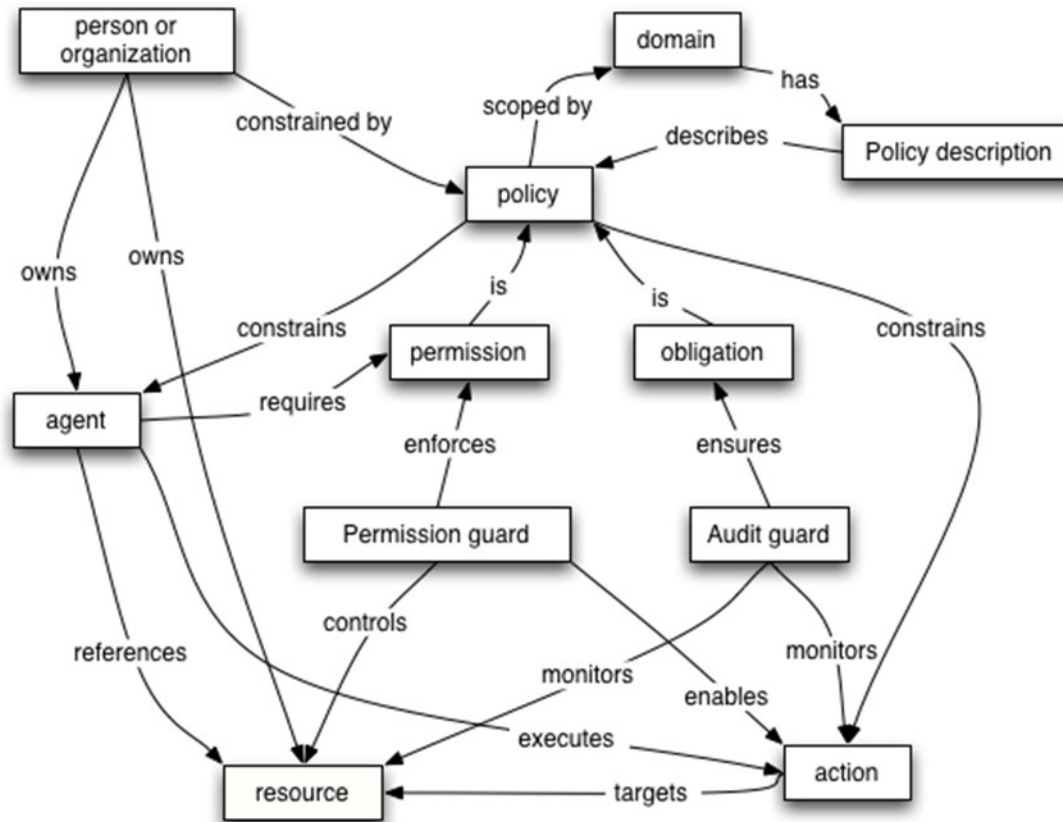
Another example



A little closer to us...

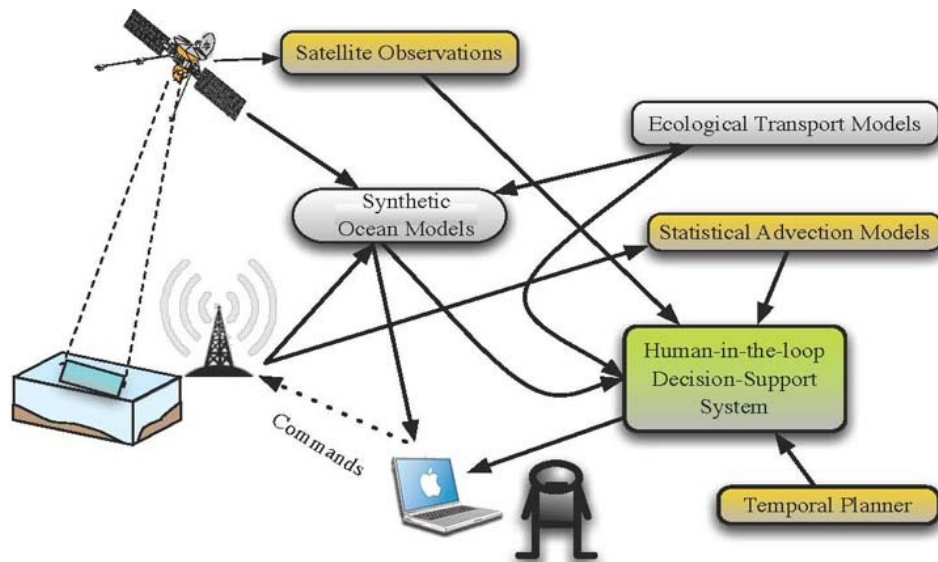


A little deeper...Policy



Source: <http://jmvidal.cse.sc.edu/talks/webservicesarch/policymodel.html>

Why does it matter?



- The ability to fuse different kinds of data will create new information services and capabilities
 - The example given many times is social media
- The ability to fuse linked data will increase capabilities
 - Stronger Decision Support systems
 - A global information space

Image: <http://www.mbari.org/canon/DSS.htm>

Guttural Hierarchy



Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)

"Huh?"

"Ahhhh"

"Duh"

"Aha!"

...What are these things?

...I see.

...rabbits eat grass, wolves eat rabbits, grass grows in soil.

if I kill the wolves, the rabbits will eat all the grass, and the soil will wash away.

Data

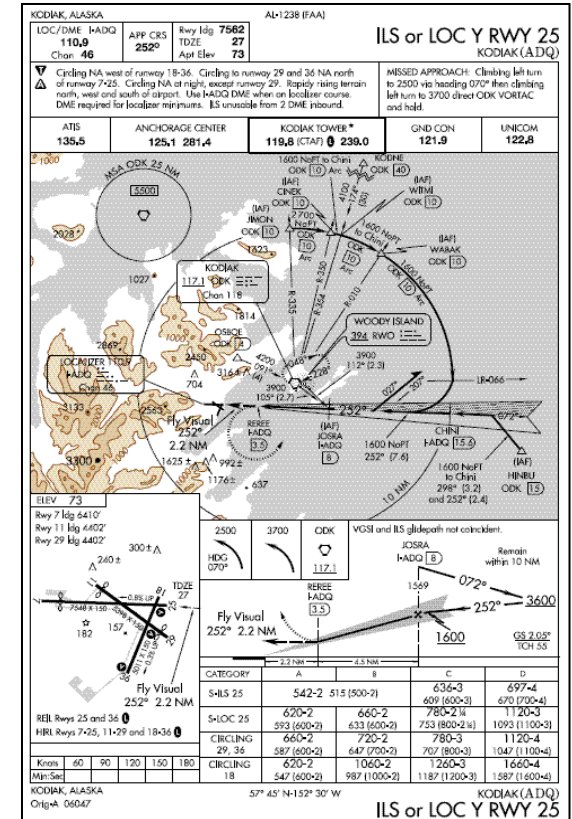
Information

Knowledge

Wisdom

Situational Awareness:

Don't fool with Mother Nature!



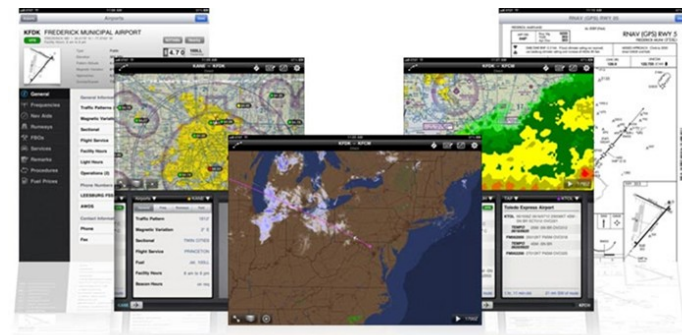
ANALOG AND DIGITAL

What our customers said they wanted

- Filter (Extract)
- Sort (Order)
- Transpose (Visualize)
- Alert (Alarm)
- Fuse (Merge)



Air Transportation Information Exchange Conference - (featuring
AIMX, WXXM and FIXM)

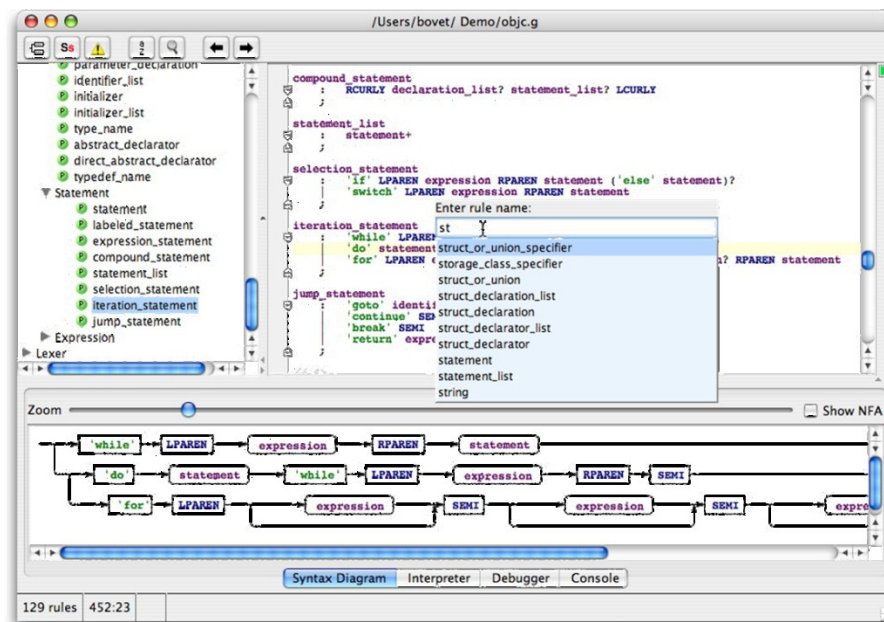


Situational Awareness

Analog to Digital



ICLE 03/598 CLE RWY 24L PAPI OTS
ICLE 02/551 CLE RWY 6R/24L RWY CL MARKINGS PARTIALLY OBSC
ICLE 01/020 CLE TWY S 3 IN RUTS SAFETY AREA AT TWY S/L/J INT
ICLE 03/473 CLE TWY J CLSD AT TWY S INT BARRICADED AND LGTD
ICLE 09/031 CLE TWY R1 CLSD
ICLE 01/027 CLE TWY A 3 IN RUTS SAFETY AREA AT TWY A/J INT
ICLE 01/049 CLE TWY Y MULTIPLE 3 IN RUTS IN WEST SAFETY AREA 50 FT
LONG 12 IN WIDE
ICLE 01/025 CLE TWY L/L2 SAFETY AREA 3 IN RUTS AT TWY L/L2 INT
ICLE 04/043 CLE TWY Y TWY LGT OTS
ICLE 11/157 CLE TWY D CLSD
ICLE 11/049 CLE RAMP PAD 3 BAYS 1-5 CLSD EXC ACFT WINGSPAN LESS
THAN 135 FT
ICLE 09/030 CLE RAMP FSS RAMP CLSD
ICLE 11/104 CLE RAMP AREA N CONCOURSE D BTN GATES D1/D28 CLSD
EXC ACFT WINGSPAN LESS THAN 86 FT
ICLE 01/657 CLE RAMP CONCOURSE D TAXI LANE E OF GATE D12 AND RAMP
ON SE SIDE OF CONCOURSE D RESTRICTED TO GROUP 2 OR LESS
ICLE 11/357 CLE RAMP CONCOURSE C RAMP TAXI LANE BTN SPOT 2 AND
SPOT 5 CLSD TO ACFT WITH WINGSPAN 118 FT AND GREATER
ICLE 11/050 CLE RAMP PAD 3 BAY 6 CLSD EXC ACFT WINGSPAN LESS THAN 94
FT
ICLE 06/049 CLE NAV GBT OTS
ICLE 01/760 CLE NAV RWY 24L LDA OTS
ICLE 01/761 CLE NAV RWY 6R LDA OTS
ICLE 10/494 CLE NAV RWY 24L ILS LLZ UNUSBL BYD 20 DEGREES LEFT OF
COURSE
ICLE 10/494 CLE NAV RWY 24L ILS LLZ UNUSBL BYD 20 DEGREES LEFT OF
COURSE
ICLE 09/325 CLE SVC AWOS 113.4 OTS
IFDC 0/4587 CLE CANCELLED BY FDC 0/4746 ON 06/08/10 16:13
ICLE 03/549 CLE NAV RWY 28 ILS OTS WEF 1103291000-1112152200
ICLE 04/087 CLE TWY Y CLSD TO WINGSPAN 79 FEET OR LESS WEF
1104072000-1111302100
ICLE 03/656 CLE RWY 10/28 CLSD TIL 1111301000
ICLE 03/180 CLE RWY 24L PAPI OTS WEF 1103091400-1106302200
ICLE 03/178 CLE RWY 24L ALS OTS WEF 1103091400-1106302200



Fusing Content



Can I get a better image?

Digital overlay over video in a terminal simulator

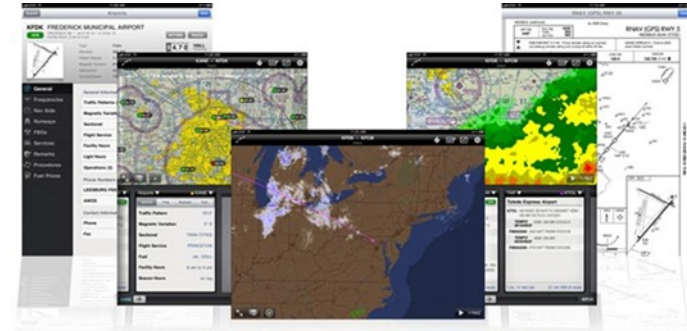


Source : DFS, Germany

Convergence



Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)



Information



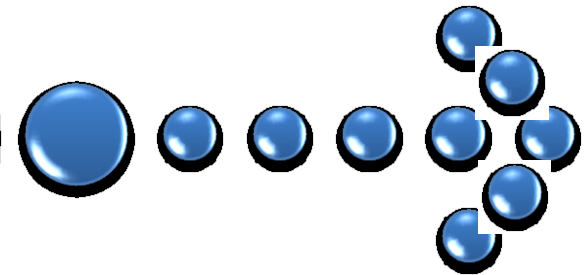
Knowledge

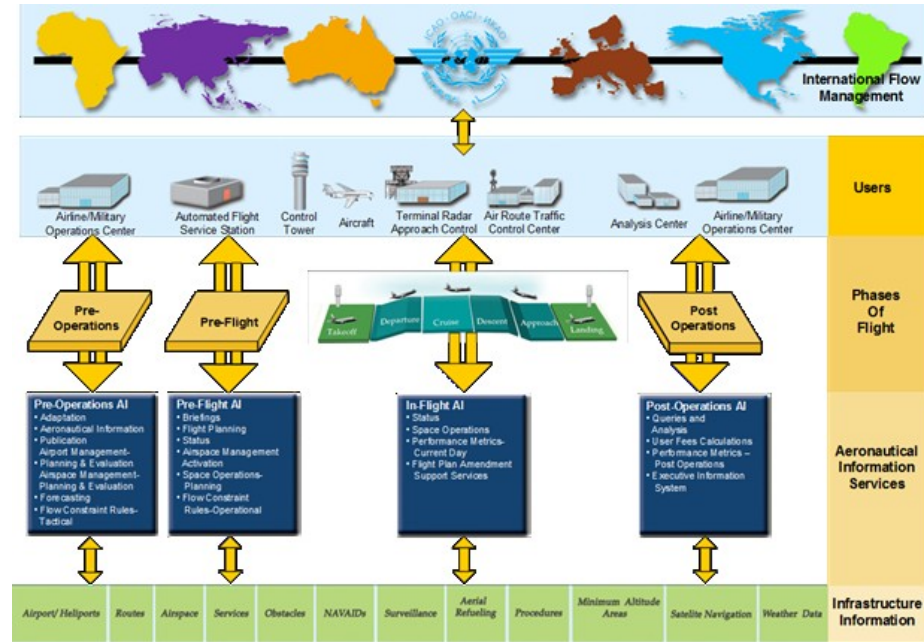


Services



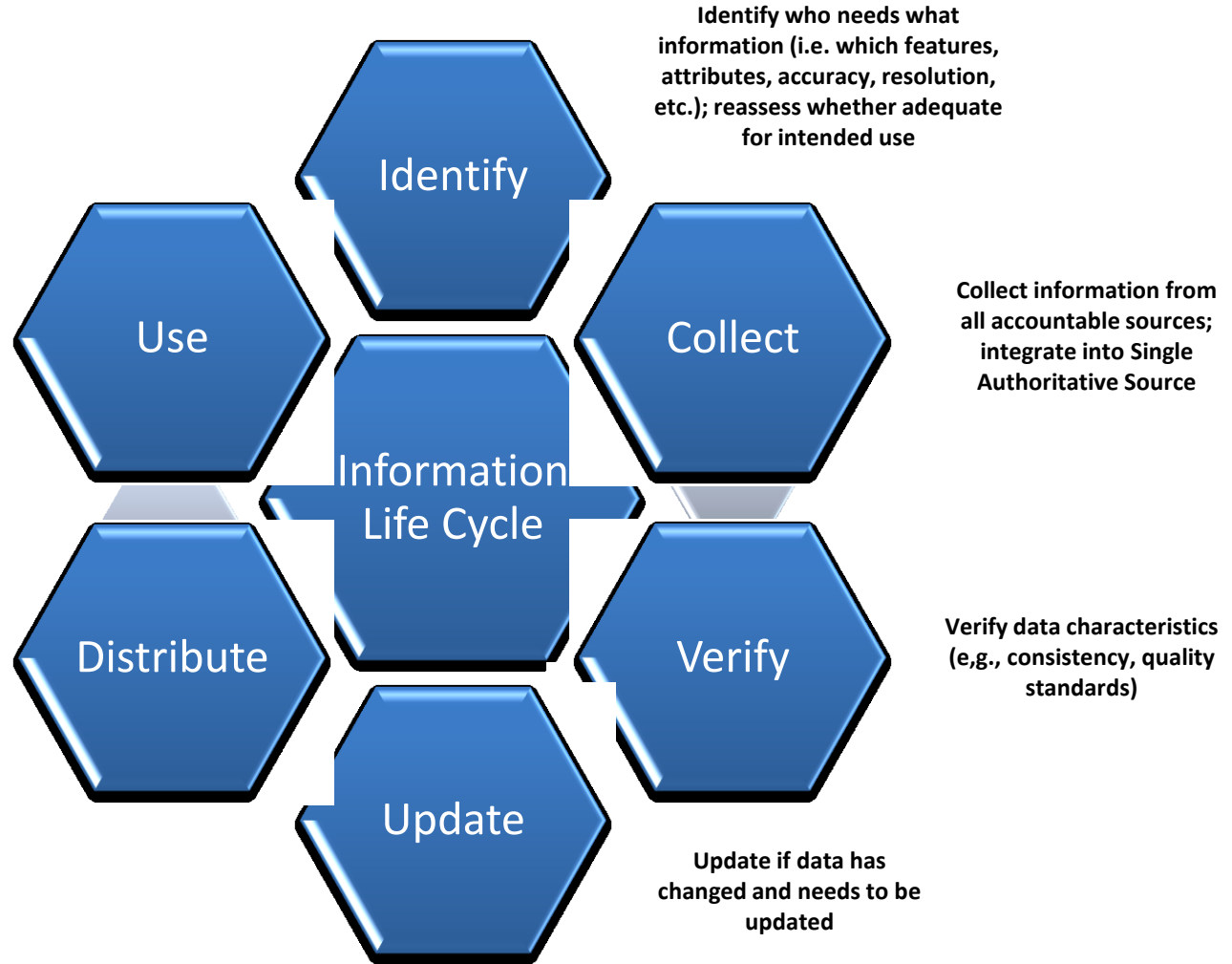
Delivery Systems



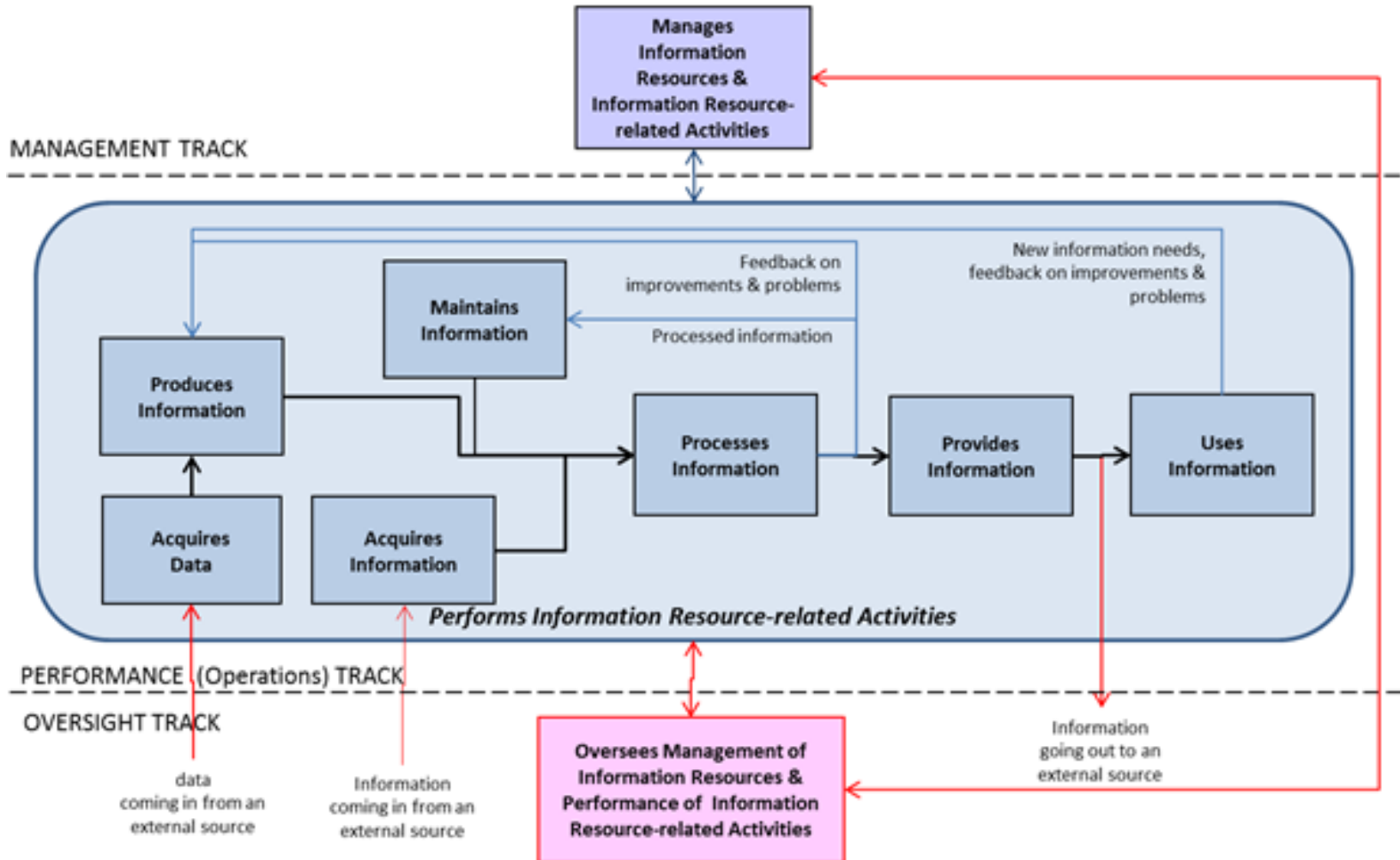


OPERATIONS OF THE FUTURE

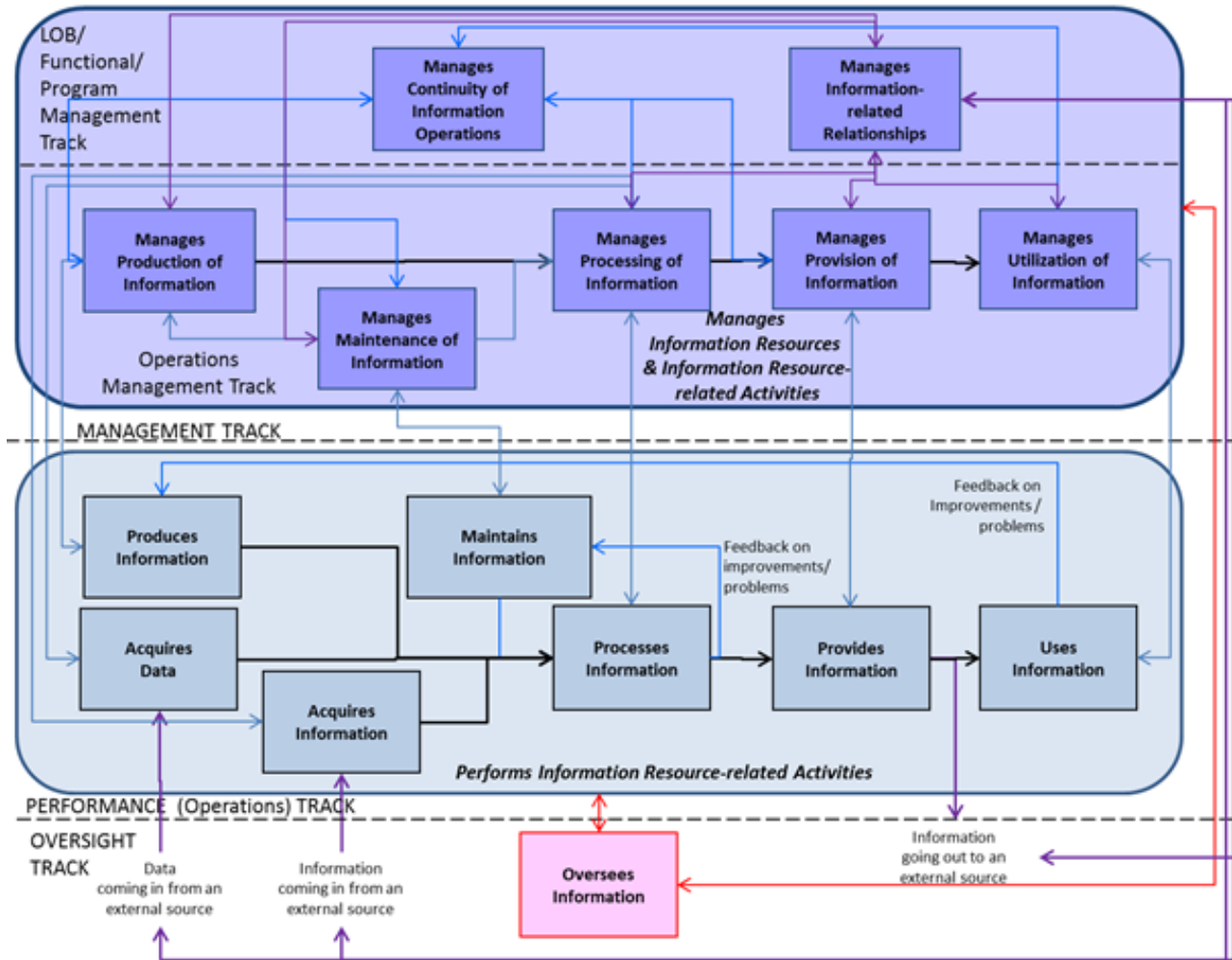
Information Lifecycle



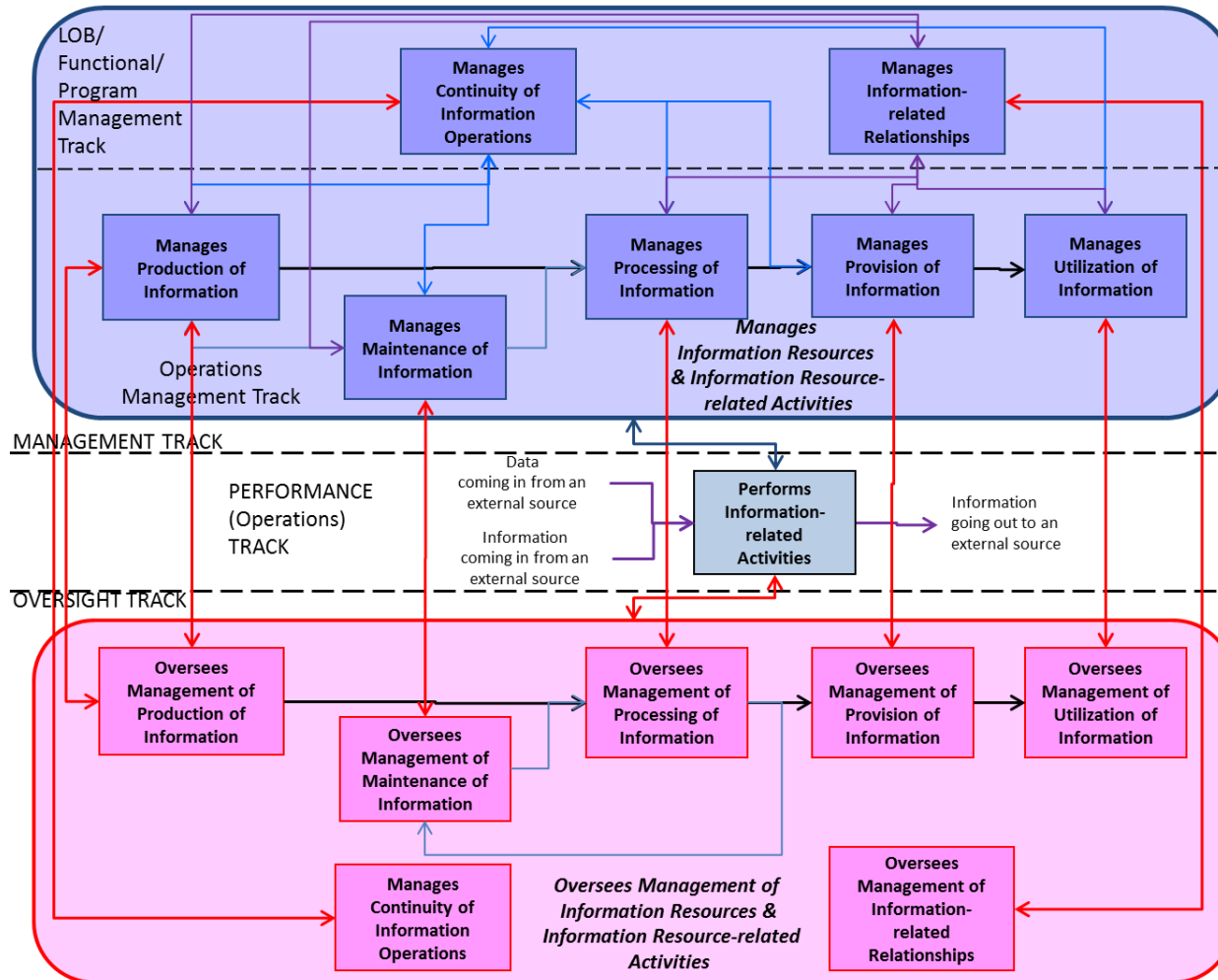
Ops of the Future



Management Track



Oversight Track





Information service delivery fit-for-purpose to support situational awareness and global harmonization

PERFORMANCE-BASED INFORMATION MANAGEMENT



Information Management Principles



Data is a resource, and information is an asset

Data is the foundation for all information products and services

Information is accessible through authoritative service provision like SWIM

Data quality is fit for the purpose of meeting ATM requirements

Data quality starts at the originator

Data and information are compliant with local laws and regulations

Data, information, and their exchange are secure and comply with information assurance standards

Common data dictionary, vocabulary, and business rules

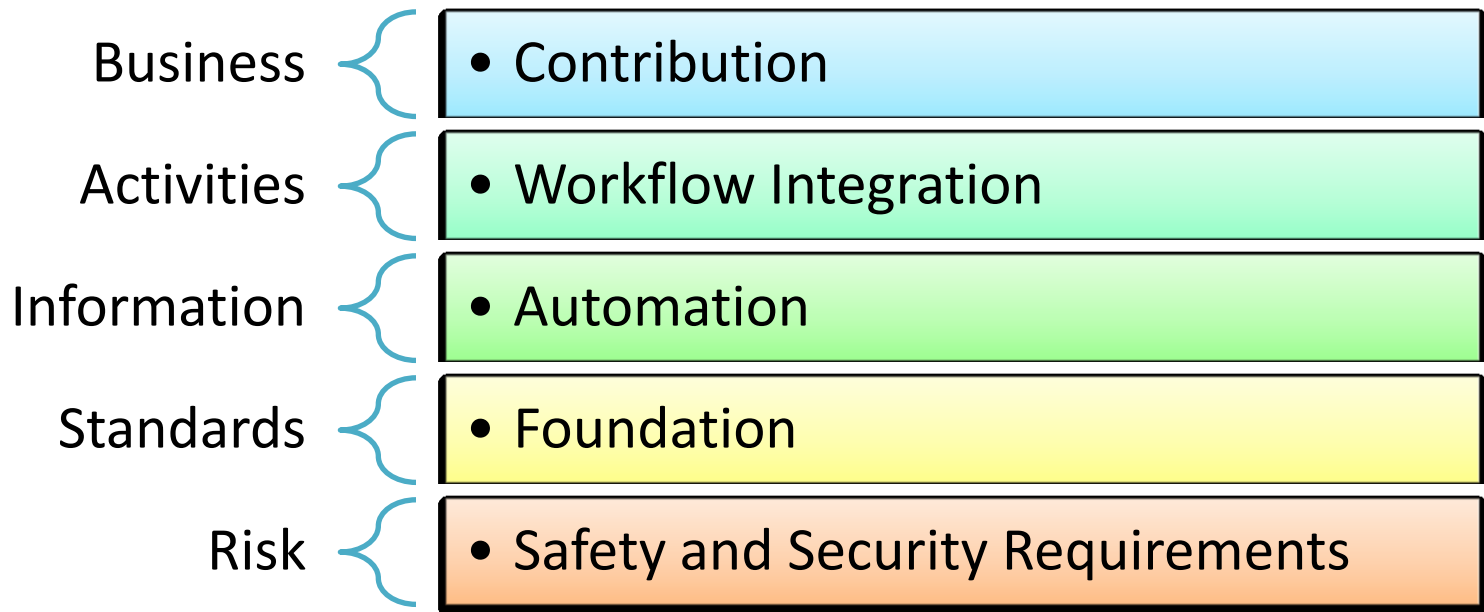
Data is not duplicated

Data management is everyone's responsibility

Performance Architecture



Principles



Performance-based Information Management

Decomposition/1



Data is a resource, and information is an asset

Business



- Life Cycle Economics

Activity



- QMS
- Staff Training
- Best Practices

Information



- Infrastructure Management
- Security
- Database
- Data Dictionary
- Metadata
- Business Rules
- Ontology

Standards



- International
- National
- Industry
- Policy
- Orders

Risk



- Safety
- Security

Decomposition/2



Data is the foundation for all information products and services

Business



- Life Cycle Economics

Activity



- QMS
- Staff Training
- Best Practices

Information



- Infrastructure Management
- Security
- Database
- Data Dictionary
- Metadata
- Business Rules
- Ontology
- SOA

Standards



- International
- National
- Industry
- Policy
- Orders

Risk



- Safety
- Security

Decomposition/3



Information is accessible through authoritative service provision like SWIM

Business



- Life Cycle Economics

Activity



- QMS
- Staff Training
- Best Practices

Information



- Infrastructure Management
- Security
- Database
- Data Dictionary
- Metadata
- Business Rules
- Ontology
- SOA

Standards



- International
- National
- Industry
- Policy
- Orders

Risk

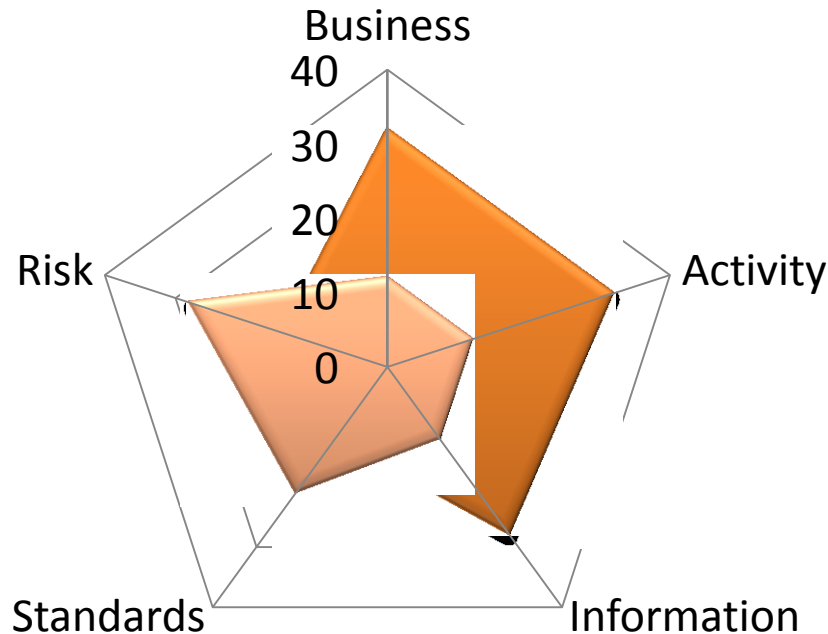


- Safety
- Security

RADAR Chart



Resource vs Foundation



- Data as a Resource
- Data as Foundation

Product Life Cycle Maturity

Goal



Air Transportation Information
Exchange Conference - (featuring
AIXM, WXXM and FIXM)

Virtual Global Information Space



Operations

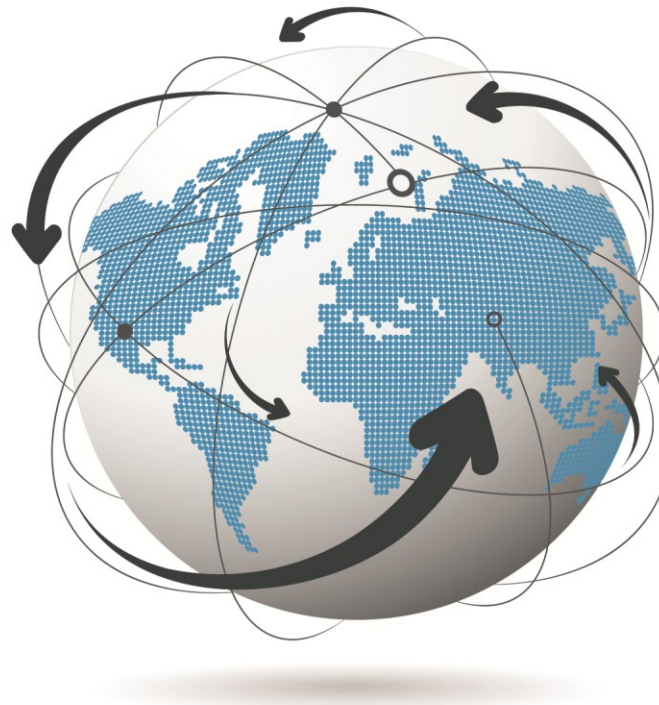


Management

Convergence is a natural outcome



Thank you!



Contact Information



Air Transportation Information
Exchange Conference - (featuring
AIXM, WXXM and FIXM)



Barry C Davis

Barry.C.Davis@FAA.gov

FAA AOV310