RIEDP
(Reuse and Interoperation of Environmental Data and Processes)

A SISO Standard for Environmental Data sharing

I/ITSEC 2017

Briefing to SISO/OGC/USGIF Session

Who is talking to you ?

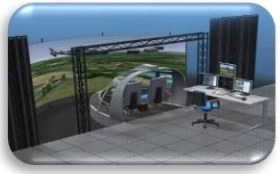
Jean-Louis GOUGEAT

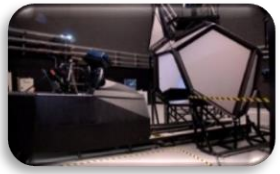
- Currently Project Manager
  - Flight Simulators / Simulation Centers
  - Networking and other Research &Technology areas
- Previously
  - Support of the French MoD in R&T areas
    - French Army, Navy, Air Force Simulation Projects
    - Studies for Staffs in Distributed Simulation
- Database Generation area
  - Not an expert
  - Trying to make the experts talk together !
  - Chairman of the RIEDP PDG
- SISO Member since 1996
- jlgougeat@sogitec.fr

Sogitec at a glance

Simulators for Training

- Mirage Family (F1, -5, D, -9, H, …)
- Rafale Omnirole A/C
- Helico (NH90, Dauphin, Cougar)
- LVC Training

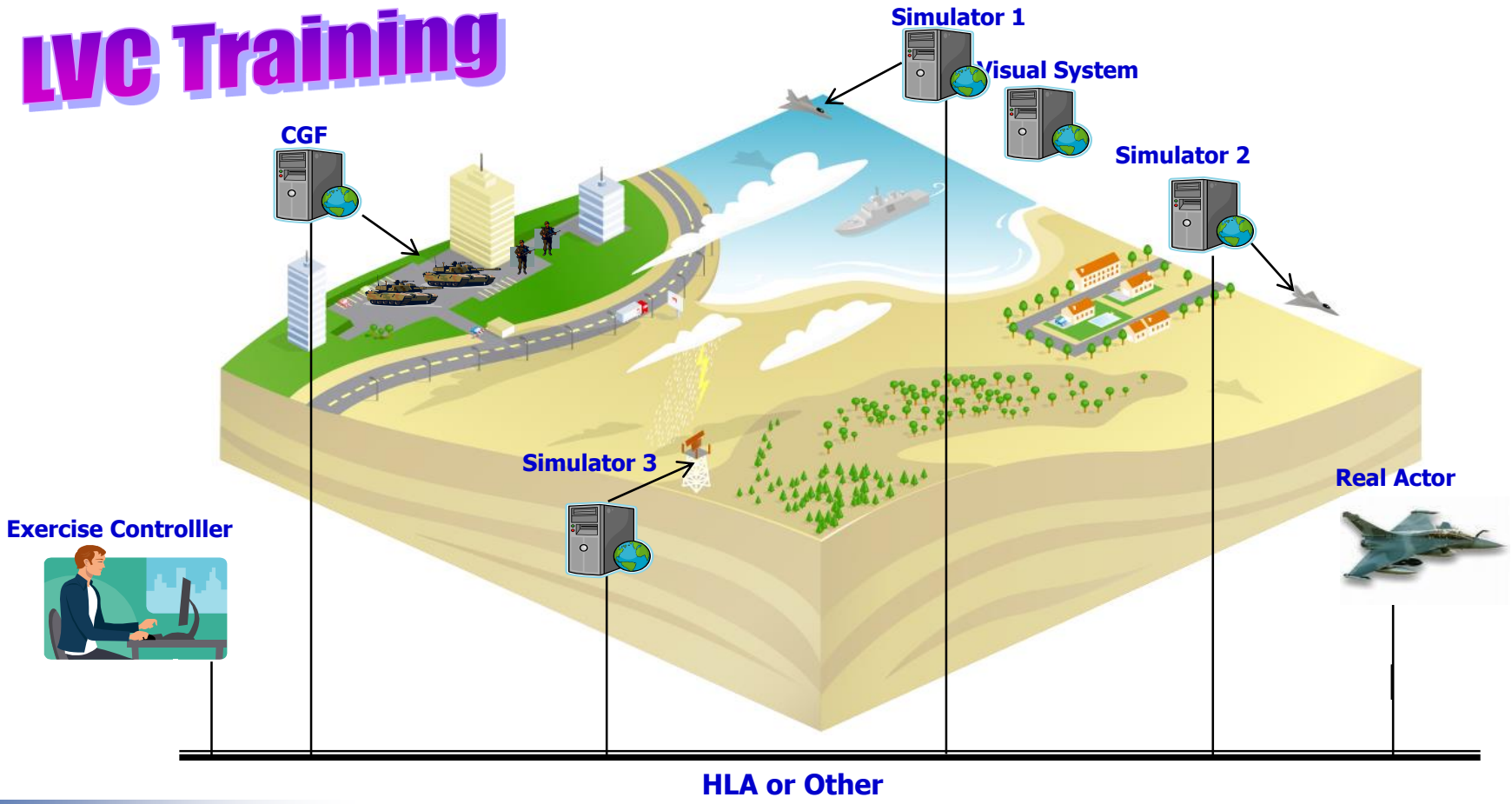




Users

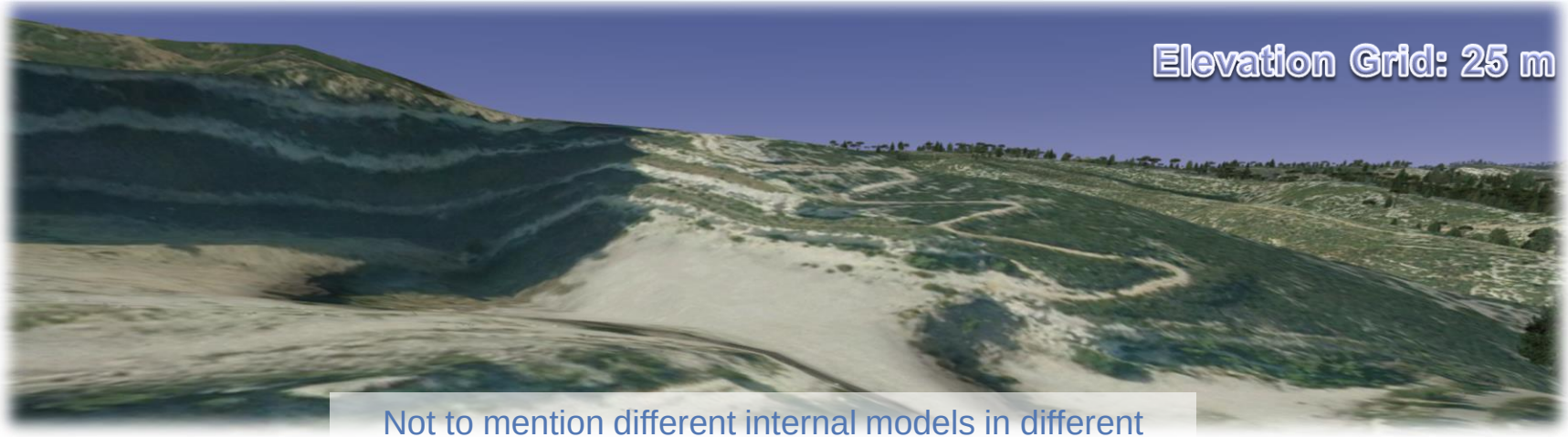
- France
  - FAF, Army Light Aviation, Navy
- Foreign users
  - NATO
  - Middle East (Egypt, Qatar, UAE, …)
  - Taiwan
  - India
  - …

Synthetic Environment
Various Contributors



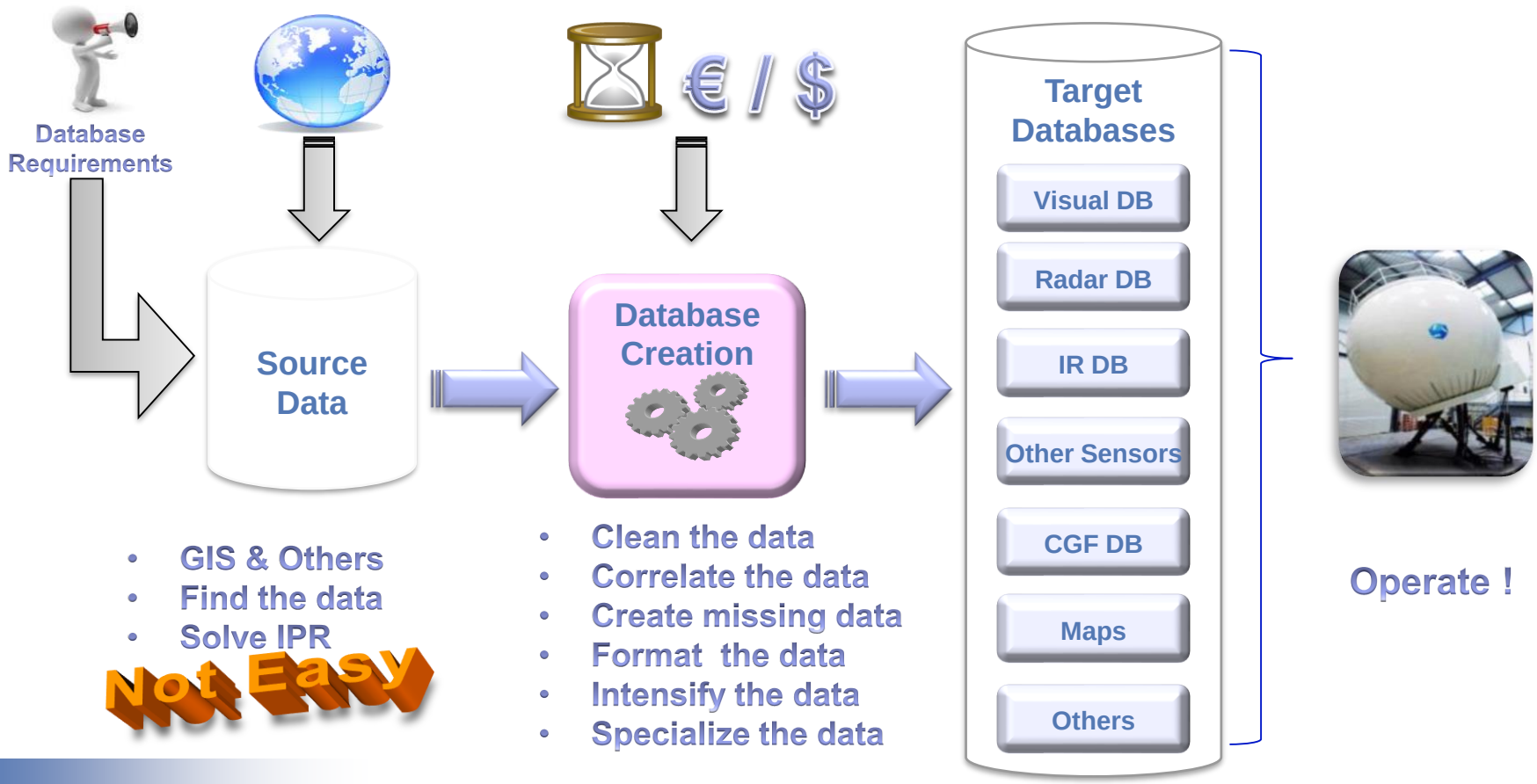
Synthetic Environment
Requirements for an Aircraft Simulator

Synthetic Environment Requirements / Fidelity



Not to mention different internal models in different simulation systems ...

Building a Simulator Database



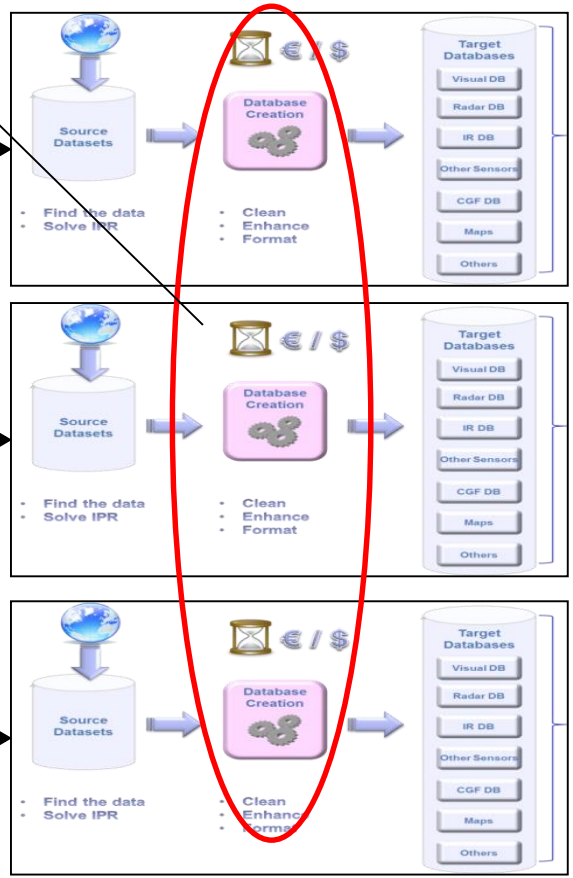
Additional issues for Distributed Simulation
Reuse – Correlation – Interoperability ….

Duplication of efforts

Duplication of Cost

Time to market

Requirements



Sim A - Provider 1

Sim B - Provider 2

Sim C – Provider 3

Consistency ?

Schedule ?

M&S Interoperability is even more critical in the International Arena with Multiple Providers and Multiple M&S Solutions

M&S Interoperability

What it is Not

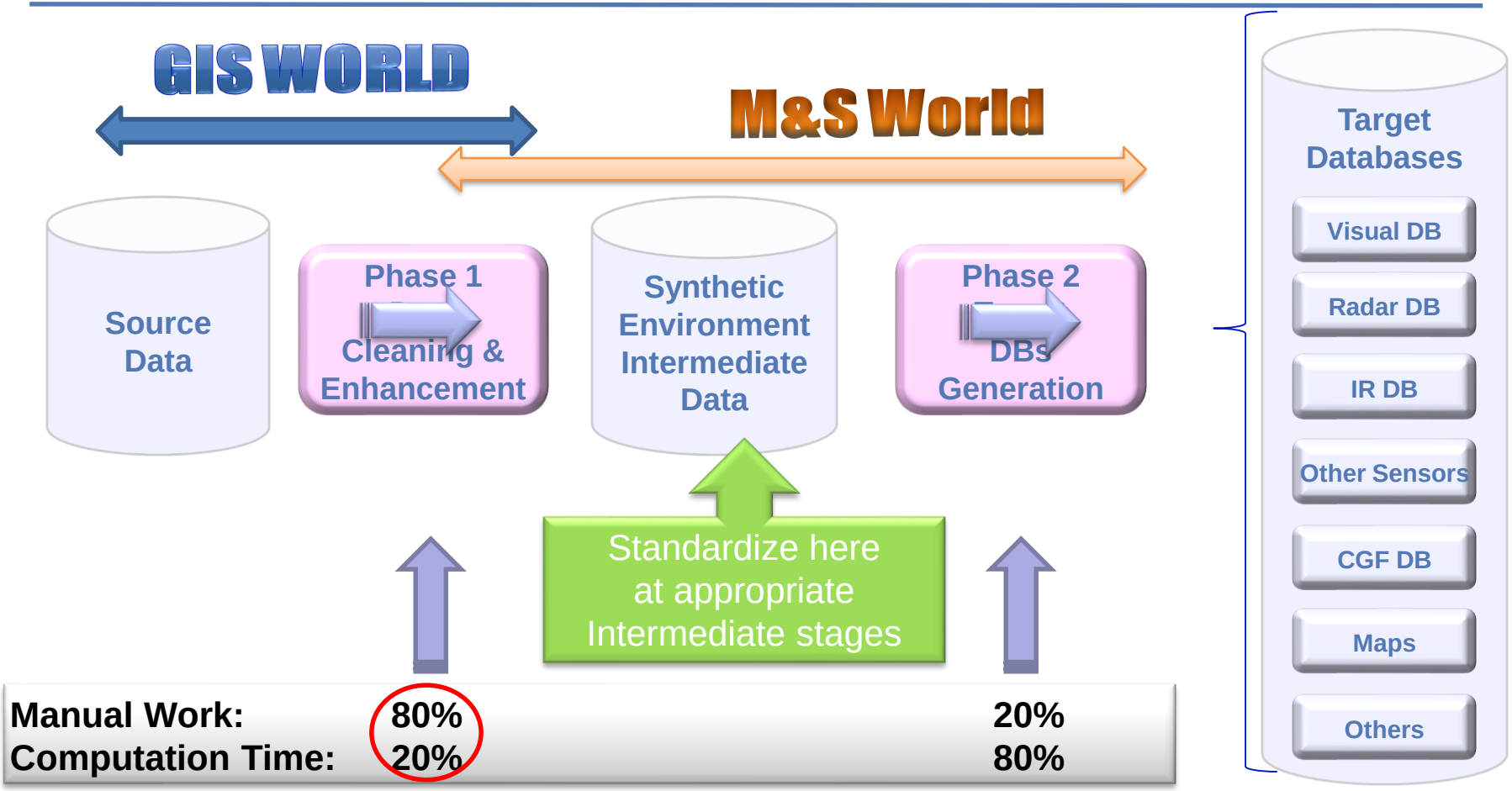
- The same Product and associated Solutions for everyone
  - Does not work, certainly not in the international arena
  - Puts innovation at risk
  - What product to choose? Single solution sufficient ?

What it is

- Consistency in Modelling, associated Data and Semantics at Component Level
- Allowing Components to work together at System & System-of-Systems Levels
- Fostering Multiple-Provider Solutions (e.g. : I/ITSEC/OBW Federations)

Interoperability relies on Appropriate Standards

Data Transformation Process – Two main phases



Data Transformation Process – Possible Improvement

The process may be made more efficient in MTDS

MTDS : Mission Training via Distributed Simulation

- If Source data is comprehensive and consistent
  - Within each and between the layers
- If previous creation efforts may be reused
  - At Source Data Level (Linked to GIS World)
  - At Intermediate Level
    - Requires Common Processes, Representations, and Formats at this level

Reuse of Intensification efforts

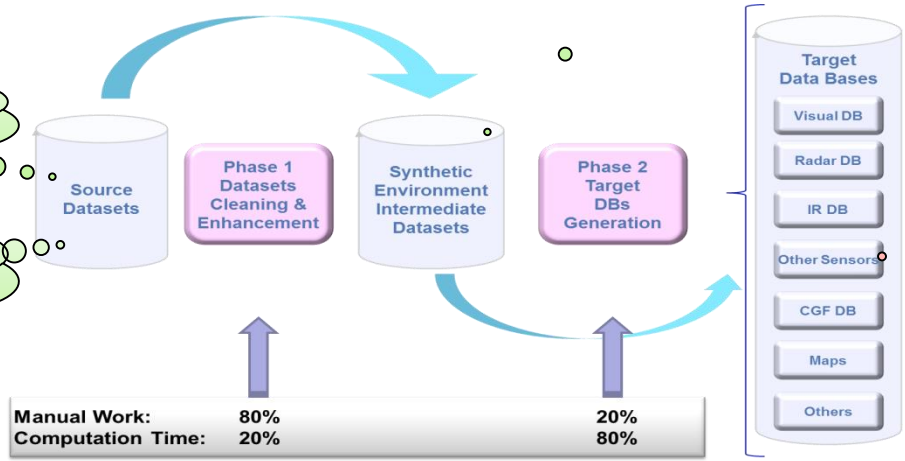
RIEDP

Providers

- Data Diversity
- Data Quality

- Discovery & Access
- Metadata

EDS



Hardly Reusable (Unless same target platforms)

Competition

Key Topics for Database sharing

When reusing data from a partner, you need to know

- How the database was built → Tasks performed or not
- How the database is represented → Conceptual Model
- How the database is spatially referenced → Spatial Reference Model
- How the database is structured → Physical data model
- How the database is organized on the media → Folders and formats
- How well the database conforms to Standards → Compliance & Profiles
- Information about the data product → Metadata

No existing solution fully satisfies <u>all</u> of these requirements

RIEDP vs other international M&S standardization efforts - Overview

Nature	Standards		Projects (Process oriented)			Projects (DB oriented)			Other
Name	SIF	SEDRIS	NPSI	AFCD	SE Core	CDB	Missionland	Other	EDS
Origin	US DOD	US DOD	US Navy	USAF	US Army	USSOCOM	NATO	e.g. French Air Force	US DoD
Introduction Date	1991	1994	2004	2006	2008	2004	2010	2006	201x
Standard	Yes	Yes ISO	User Standard	User Standard	User Standard	User & Commercial Standard	User Standard	User Standard	Reuse of Standards
Open Standard	Yes	Yes	limited	limited	limited	OGC	limited	limited	-
Approach	Format according to standard	Standardized Semantics and Data Model + Format according to standard	Based on de-facto standard formats (GIS Sou[illegible]) but No consistent Semantic[illegible] Simila[illegible]						Data Discovery & Access
Availability of Commercial Support Tools	Obsolete	Tools developed in SEDRIS COI	[illegible]cial tools [illegible]mercial & standard formats						Portal

RIEDP addresses these Topics

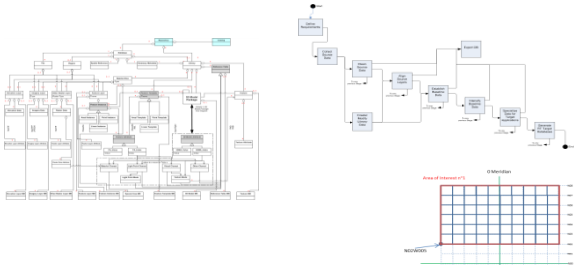
AFCD: Air Force Common Dataset
EDS: Enterprise Data Services
NPSI: NAVAIR Portable Source Initiative
CDB: Common Database

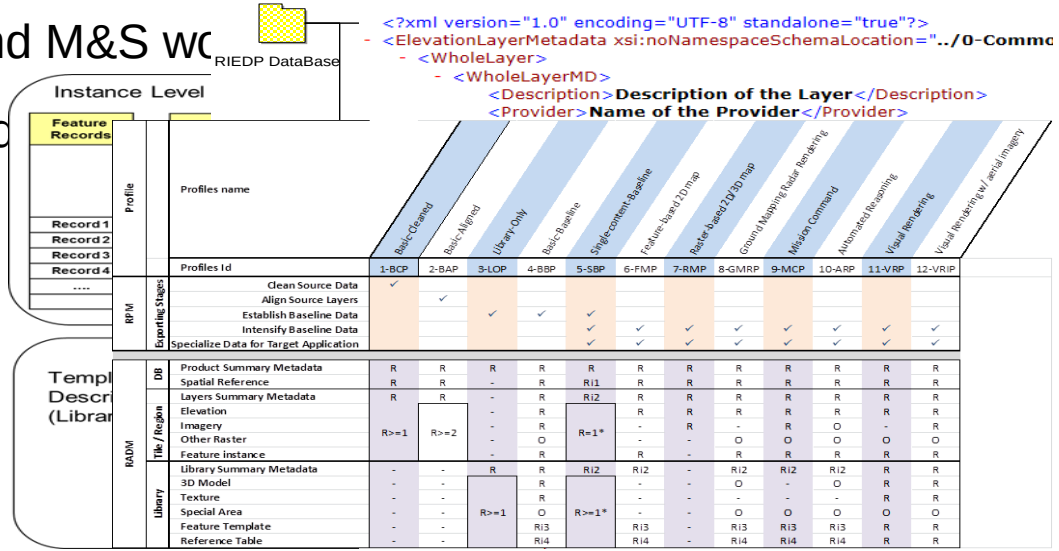
SEDRIS: Synthetic Environment Data Representation and Interchange Specification
SE Core: Synthetic Environment Core
SIF: SSDB (Standard Simulator Database) Interchange Format

RIEDP Summary

RIEDP provides what is needed to share Environmental data :

- A Reference Process Model
- A Reference Abstract Data Model
- A Spatial Reference Frame
- A List of Formats from the GIS and M&S wo
- A Semantic through attributes and
- An Organization on the Media
- A Metadata structure
- A set of Profiles






```
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <ElevationLayerMetadata xsi:noNamespaceSchemaLocation="../0-Commo
  - <WholeLayer>
    - <WholeLayerMD>
        <Description>Description of the Layer</Description>
        <Provider>Name of the Provider</Provider>
```

Status of RIEDP Products at end 2017

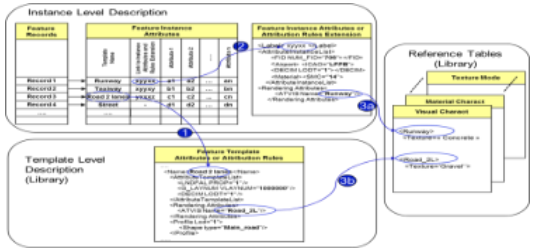
Product n°1

- RIEDP Data Model Foundations (All Except Semantics)
  - Formal Review completed
  - Update of the Document completed
  - Submitted to Balloting End of November 2017
  - Conclusion expected early ‘18

RIEDP DM Foundations V 1.2a

Product n°2

- RIEDP Detailed Features Description (Semantics)
  - Development initiated Summer 20107
  - Conclusion expected end ‘18



Take away

- RIEDP
  - Takes **benefit of the lessons learnt** from all related Initiatives
  - Reuses and relies on **existing standards** (such as SEDRIS ISO/IEC standards and PNG ISO/IEC standard), as well as **formats commonly used in the community**
  - Represents the **best common denominator** by providing a Reference Process Model (**RPM**), a formal Reference Abstract Data Model (**RADM**), relying on use of **existing Formats**, specifying **unique Profiles**, and focusing on **metadata and attribution semantics**
  - **Does not impose internal solutions** on producers
  - Provides a **common data sharing approach** that relies on a formal abstract data model (RADM), along with specific metadata and attribution (Product #2)
- This allows the **best sharing** of data, **independently from target applications** implementation, with a current scope addressing **static terrain** and Visual System (Flight Sim) data

RIEDP PDG – Get Involved

Please Join SISO by becoming a SISO Member

- by attending the SIW Meetings
- by registering on the Web Site ($ 95)

Then share with the community

- PDG SISO Discussion - **Register** for Discussion:
  - Logon to SISO Discussions and select
    - SAC-PDG-RIEDP (Don't forget to select SUBMIT !)
- PDG SISO Webpage - **Complete Affiliation Form**:
  - Standards Activities > Development Groups >
    - Reuse and Interoperation of Environmental Data and Processes (RIEDP) PDG
- PDG SISO Library File Folder – Access PDG Documents:
  - SISO Digital Library > Development Groups > RIEDP PDG

Conclusion

- Thank you for your attention !

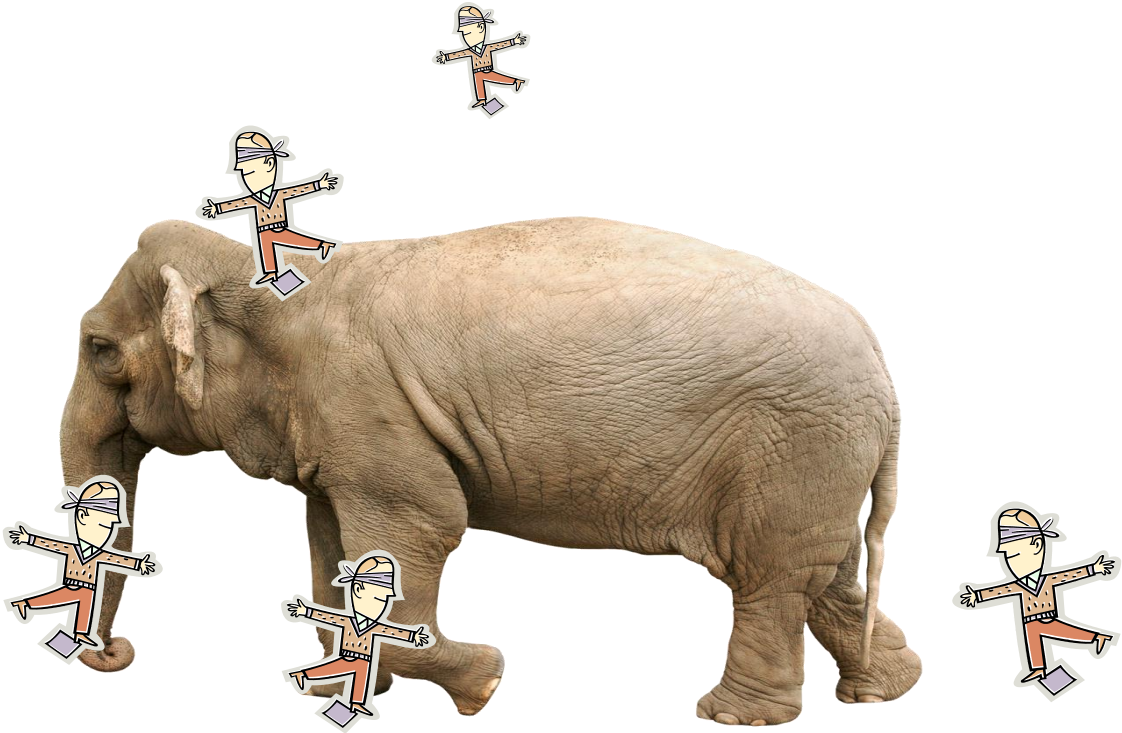
- Any questions ?

- Full version of the Brief available on the SISO WebSite
  - https://www.sisostds.org/Default.aspx?tabid=105&EntryId=46112

Please Join !

Backup

Fable of “The Elephant and the Blinds”



Representation of complex Things heavily depends on the Standpoint …