

The MERLIN and MINERVA Team— An Unmatched Solution for Agile Intelligence Analysis!



Together, MERLIN and MINERVA will automate even the most demanding intelligence workflow. MERLIN and MINERVA make intelligence analysis “More Agile” by:

Improving Situational Assessments

- Focus analysts on higher value assessments
- Create a more comprehensive analytical understanding by combining tactical, strategic, and historic multi-INT information
- Increase the confidence level of decisions by using automation to allow more time to support multiple “What If?” scenarios

Reducing the Risk of Acquiring New Analytical Capabilities

- Add new analysis capabilities without affecting existing intelligence workflows
- Leverage existing end-user applications, such as ArcGIS, Google Earth, and/or web browsers
- Reduce data storage needs by accessing data from authoritative data stewards through a compartmentalized security model

Simplifying Inter/Intra-Agency Interoperability

- Facilitate data/service exchange via international open standards-based interfaces
- Enable and encourage re-use of common information held by secure authoritative data stewards

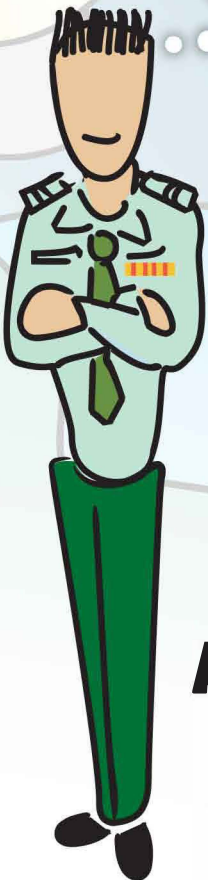
Increasing Analyst Productivity

- Leverage workflow automation, which allows analysts to complete more analyses
- Eliminate duplication of effort through reusable, self-describing workflows that are interoperable across organizational boundaries

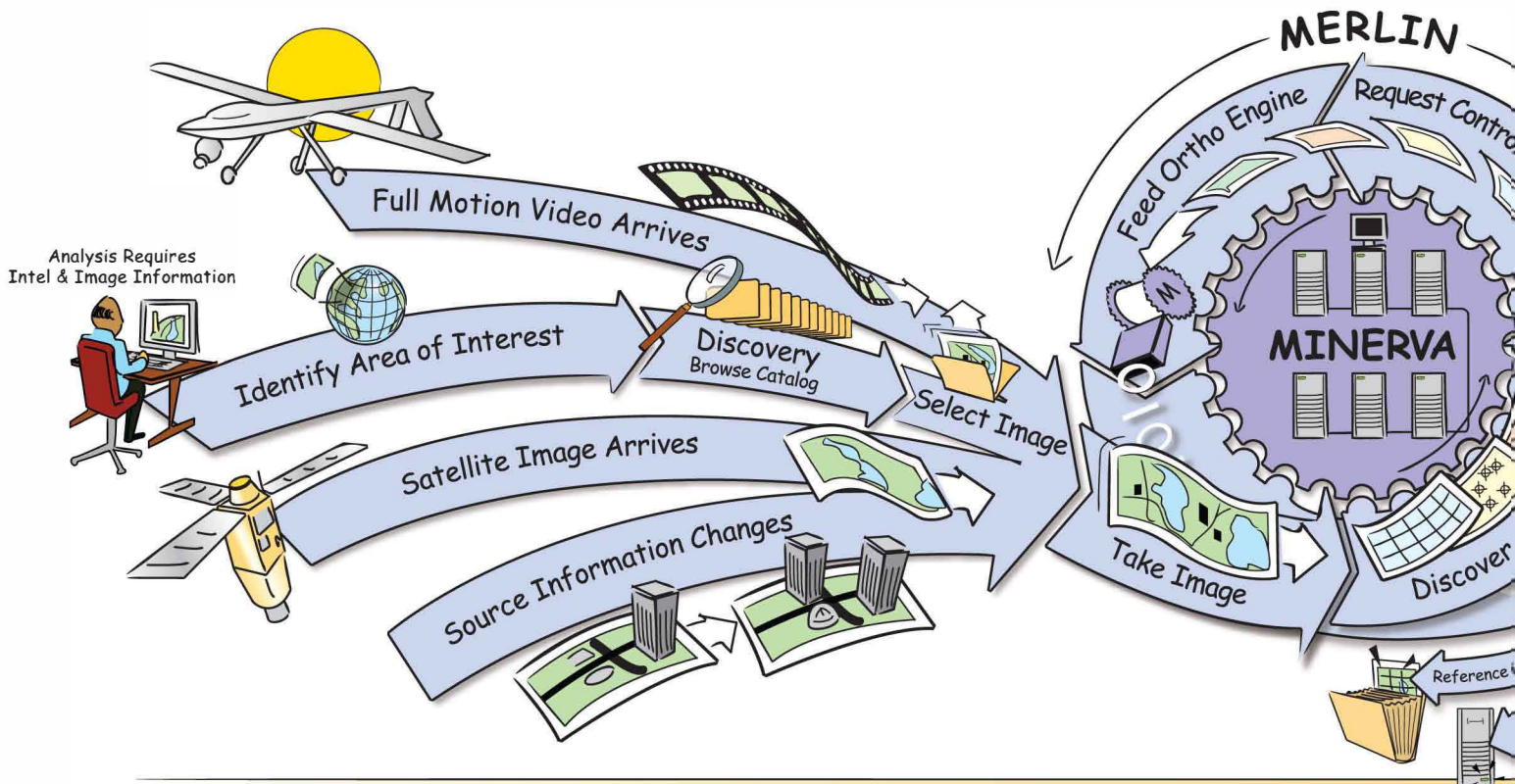
Automating Finished Product Production Systems

- Replace manual geospatial intelligence product production systems with fully automated workflows that incorporate a quality control/quality assessment review process

What is MINERVA?



Automated Full Motion Video Exploitation!



Event Driven Service Oriented Arch

MERLIN—Intelligent Workflows

MERLIN is an automated processing framework for intelligence workflows that provides multi-INT enabled solutions to “hard” intelligence analysis and mapping problems.

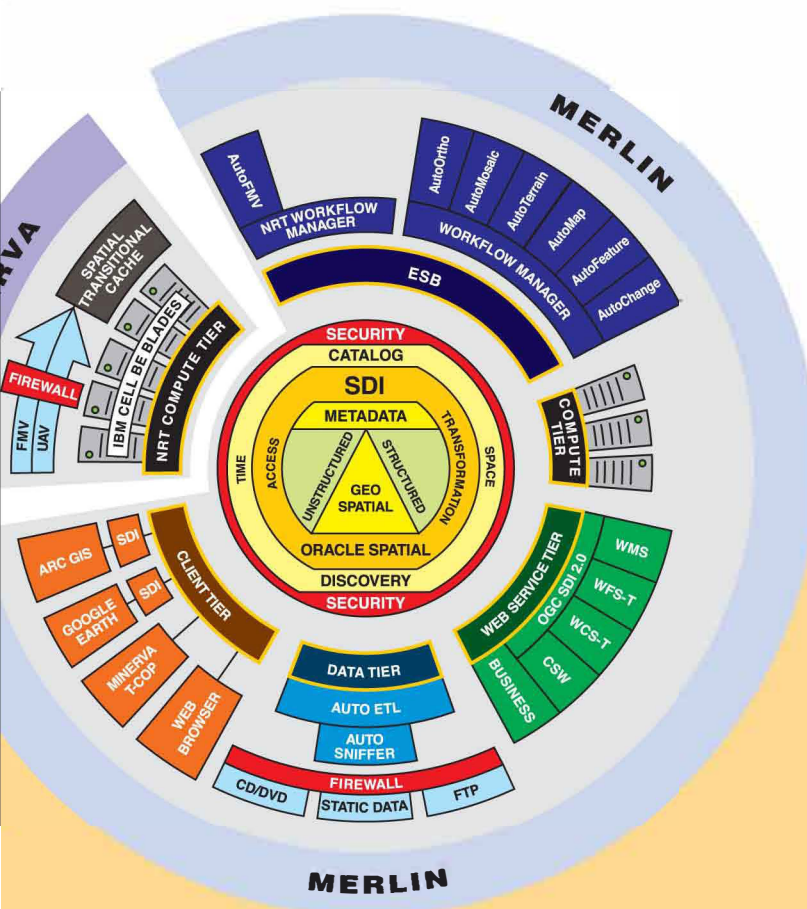
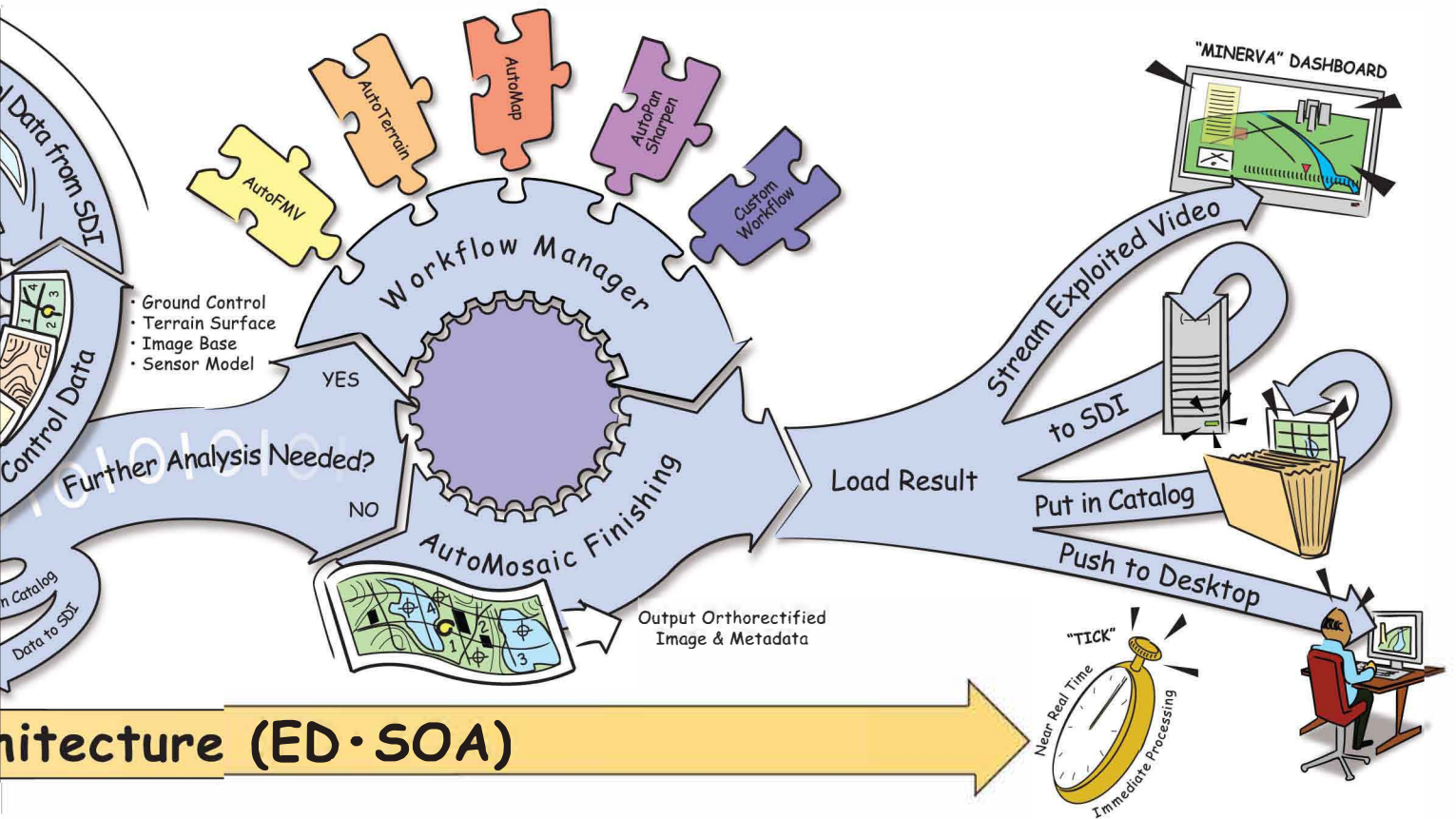
Key MERLIN design features include:

- **A Service-Oriented Architecture (SOA).** Discrete workflow tasks are designed as reusable services, creating a plug-and-play solution that reflects the specific needs of end users while reusing common capabilities as services.
- **Best of Breed Commercial Software.** Supports an integration methodology that matches the best available commercial software with a specific customer need. As needs evolve or technologies change, workflow configurations can be updated with minimal reintegration impact.
- **Open Standards-Based Inputs and Outputs.** Replaces the stove-pipe paradigm of system building with an agile solution that can adapt over time to embrace new sources of data and new clients or consumers of MERLIN products and services. This means that MERLIN can act as both a distinct system solution and an authoritative data steward of data, products, and services to multiple end users throughout an enterprise.
- **A Common Data Management Architecture within a Spatial Data Infrastructure.** Applications can discover and access any data known to MERLIN wherever it resides, within the relevant context of space, time, content, and relevance to a specified user community.

- **Repeatable and Auditable Workflows.** Provides assurance that quality control requirements are met, that future forensic analysis can be supported, and that specialized tradecrafts can be codified. All of this provides the foundation for workflow automation.
- **Pre-Packaged “Best of Breed” Workflow Applications.** Codifies common functionality within an open standards-based wrapper to deliver consistent results throughout a multitude of communities to truly facilitate interoperability among those communities.

MINERVA—Near Real-Time Exploitation of Tactical Data

MINERVA extends MERLIN to provide automated near real-time exploitation of tactical sensor feeds, such as full-motion video from unmanned aerial vehicles (UAVs) or surveillance cameras. MINERVA dynamically repackages the exploited results into an MPEG stream to deliver an open standards-based tactical Common Operational Picture to downstream end users in near real time.



Key MINERVA design features include:

- **Event Driven Processing.** MINERVA enables MERLIN to respond immediately to the arrival of new near real time information such as multi-INT enabled full-motion video. It also provides the mechanism to further de-couple workflow functionality and distribute the processing requirements throughout the compute tier.
- **High-Speed, Scalable Processing Environment.** MINERVA has an expandable architecture of high-speed IBM Cell Broadband Engine (B.E.) blade servers, originally developed for the video game industry.
- **Leverages the MERLIN Automated Processing Framework.** MINERVA is optimized to work within the MERLIN Service Oriented Architecture. This enables the seamless integration of multiple tactical, near real-time feeds with strategic intelligence information.

Automated Analysis Workflows



AUTOortho Workflow

- Auto orthorectification for all raw image types utilizing the best available control data



AUTOterrain Workflow

- Auto terrain extraction from imagery, IF-SAR, and LIDAR



AUTOmosaic Workflow

- Auto mosaicing for raw and orthorectified imagery



AUTOtransform Workflow

- Automatic transformation of well described data sources into types, forms, and formats required by other automated workflows

AutoPanSharpen Workflow

- Automatic pan sharpening for imagery and RADAR

AutoFMV Workflow for MINERVA

- Near real-time orthorectification of video frames:
 - Transparent overlays of geospatial intelligence data
 - Moving map mosaics for each sensor
 - MPEG-7 multimedia indexing and discovery of video content
 - MPEG-4 near real-time dissemination

Extend MERLIN and MINERVA with Customized Workflows

The following workflows represent some examples of customized workflows that could be developed to extend the capabilities of MERLIN and MINERVA to meet the specific needs of a user community.

AutoMap

- Automatically create finished web maps, with open standards-based symbology, annotation, and overlays disseminated directly to the web
- Provides a finished web map with a look and feel similar to commercial web maps produced by MapQuest, or a finished plotted map sheet with a look and feel of those produced by USGS, NGA, NOAA, or National Geographic

AutoCIB

- Automatically extend the AutoMosaic workflow with an NGA-certified CIB cell product finisher
 - MIL-PRF-89041A or MIL-STD-2411-2



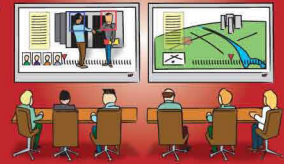
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I have mission critical analysis needs

TODAY

- Stove-piped implementation
- Little commercial software
- Few standards
- Generally not Multi-INT
- Limited interoperability



TOMORROW

- Plug & play architecture
- Best of breed commercial software
- Standards-based solutions
- Multi-INT Enabled
- Enterprise-wide interoperability

I analyze imagery and maps

TODAY

- Arduous data discovery process
- Time-consuming material data production
- Non-repeatable results



TOMORROW

- Automated data discovery process
- Time-saving automated workflows
- Repeatable and auditable results

I have a new source

TODAY

- Frequently requires building a new stove-pipe
- Requires years of system engineering
- Tightly coupled integration
- Extremely expensive
- Slow to deploy



TOMORROW

- Describe source plug-in
- Largely self-described components
- Loosely coupled supporting customization
- Very inexpensive
- Rapid deployment in weeks or months

Supporting Sponsors:

