

Space Exploration Logistics Workshop

17-18 January 2006

Omni Shoreham Hotel, Washington, DC



Group C

Database Management

Group Leader

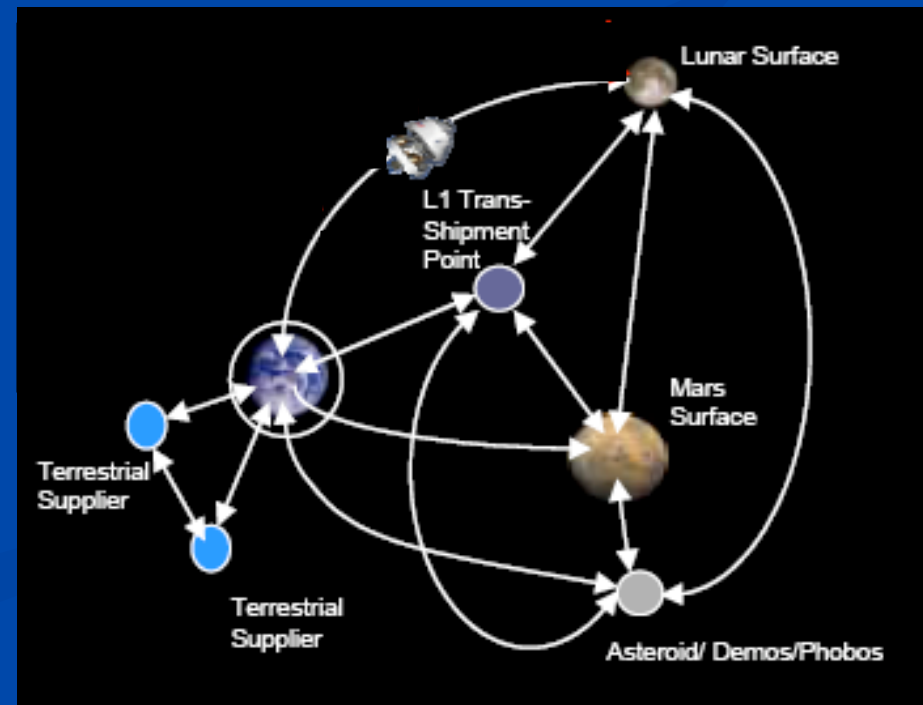
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Group Facilitator

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Group Scribe

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Session Overview



■ Database Management Scope

- A discussion that covers the critical issues of logistics database management for exploration missions

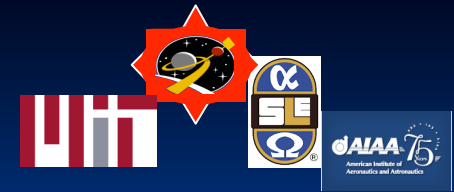
■ Goals

- Identify and define the impact of logistics database management issues on the three different exploration mission types

■ Organization

- Identify the important issues (starter list + attendee participation)
- Pick the “top 3” issues/topics relevant to each exploration mission type
- Discuss potential impacts, mitigations and opportunities, early tests/demonstrations, and interfaces to other systems

Discussion Points



- ❑ Required functionality of logistics database
 - ❑ Operations support (crew, mission controllers, load masters, etc.)
 - ❑ Acquisitions support
 - ❑ Systems engineering and analysis support
- ❑ Maintaining data integrity
 - ❑ Database design
 - ❑ Data heritage
 - ❑ Data element ownership/data rights
 - ❑ Multi-source compatibility
 - ❑ Auditability/review
- ❑ Database security
 - ❑ Unauthorized access
 - ❑ Protection of contractor proprietary data
 - ❑ International partner participation
- ❑ Configuration management

Issues - Short Lunar Mission



1. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

2. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

None Identified

3. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

Issues – Long Lunar Mission



1. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

2. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

None Identified

3. *Issue:*

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

Issues – Mars Mission



1. Issue: Capture and Use of actual Performance Data/RMS Data to feed into future system/components

Predicted Impact: Reliability Improvement in Hardware/System

Potential Mitigation: Focused development

Testing Methods: Human analysis and testing

Impact on Other Systems: A). Positive impact on systems/hardware

B). Higher level of quality and safety both on ground and in Space

C). Positive impact on industry (esp. Space tourism)

Possible Solutions: A). Better on-board diagnostics and prognostics

B). Use the information already receiving

C). Develop models

2. Issue: Provide crew with needed logistics information

Predicted Impact:

Potential Mitigation:

Testing Methods:

Impact on Other Systems:

Possible Solution(s):

-longer missions, less structured, need more crew info

Issues – Common to all Missions



1. Issue: Increasing data connectivity and integration

Predicted Impact: lower cost, fewer errors if corrected
eliminate redundancies
data validation
better visibility

Potential Mitigation: Grow legacy systems or build new

Testing Methods:

Impact on Other Systems:

Possible Solution(s): Corporate culture of configuration management and standardized data elements

2. Issue: Defining Critical Functional System Requirements and Interfaces germane to the new missions

Predicted Impact:

Potential Mitigation: Need goals/metrics/key performance indicators/ROI/functions
Need to first understand the current architecture and ownership of databases and interactions between them

Testing Methods:

Impact on Other Systems:

Possible Solution(s): Apply lessons learned from existing programs

Common to all Missions



- 3. Issue: Top-Down Direction
- Predicted Impact: Continuation of the “Tower of Babel”, silos, stove-piping
- Potential Mitigation:
- Testing Methods:
- Impact on Other Systems: Reliability Standards
- Possible Solutions: NASA Headquarters (CFO, OCE, OCIO?)
New team of logisticians, CLO?
GFE provided, Emergence , Net-Centricity

Other Issues Not Developed



- Common Definition of Logistics? (or SCM?)
- Multiple non-standard, non-integrating databases that are continuously evolving/being replaced
 - Configuration Management
 - Standardized Data Elements
 - Modular Interoperability
- Cataloguing
- Database Security
- Reliability Standards
 - Six sigma culture