



Overview

PDS 2010 Tech Session

June 10-11, 2009

Outline

- Welcome and Logistics
- Purpose/Goals/Charge
- Plan and Progress
- Technical Background
- Important Technical Design Concepts
- Key discussions for this meeting

Welcome

- Logistics
 - Restrooms – North/West corner of building
 - Escorts – make sure you walk around Lab with someone who has a JPL badge
 - Lunch – Cafeteria
 - Group Dinner Sign up – Café Bizou or Louise's Trattoria
 - American Heritage Event
 - Introductions
- Start/End Times
 - Thursday we will begin at 8:30 AM and finish by 4:30PM

Technical Session Objectives

- Purpose
 - To discuss and review the design of the two elements of PDS 2010
 - Software (Services, Tools)
 - PDS4 Data Design (Model)
 - Provide an opportunity for “education” regarding the design approach and available supporting implementation technologies
 - Ensure there is ample opportunity to capture and integrate feedback
- Goals
 - Effectively communicate the PDS 2010 designs for the software and PDS4 data components
 - Understand best practices in determining the PDS design approach
 - Understand the design benefits, trade-off and impacts in selecting a design
 - Ensure PDS has a design plan that will scale and support our data suppliers and users over the next decade

Feedback Process

- Feedback forms are provided
- Use the forms to document recommendations or issues for the team
 - Nodes are encouraged to fill them out or send an e-mail to Emily Law (emily.law@jpl.nasa.gov) documenting the issue and providing a recommendation
- Feedback will be collected and categorized as
 - Data design issue
 - Software design issue
 - Project management issue
- Feedback will be dispositioned by the teams and reported on at the August MC

Agenda

Today (June 10)

- 9:00 a.m. - PDS 2010 Project Update
- 9:45 a.m. - Overview of Data Design & Discussion
- 11:00 a.m. - Overview of System Design & Discussion
- 1:15 p.m. - System Design Discussion
- 3:00 p.m. - Detailed PDS4 Data Model Discussion
- 6:30 p.m. - Group Dinner

Tomorrow (June 11)

- 8:30 a.m. - Calibration Data
- 9:15 a.m. - PD4 Data Dictionary Discussion & Planning
- 10:15 a.m. - PDS4 Grammar Discussion
- 11:15 a.m. - PDS4 Standards Reference Plans
- 1:00 p.m. - PDS4 Data Transformation Options & Discussion
- 2:45 p.m. - System Transition, Migration & Impact
- 3:45 p.m. - Wrap Up

PDS 2010 Schedule

Activity Name	Duration (Work Days)	Start Date	Finish Date	2008				2009				2010				2011				
				4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Concept/Study Phase...	240.00	8/20/07	7/18/08	[Red bar]																
Project Planning...	133.00	1/7/08	7/9/08	[Red bar]																
Architecture/System Engineering...	254.00	7/10/08	6/30/09			[Red bar]														
P1. Data Standards Project	455.00	1/2/09	9/30/10					[Red bar]												
PDS 2010 Data Standards Implementation Plan	1.00	1/2/09	1/2/09																	
General Data Model (Draft)	84.00	1/5/09	4/30/09					[Red bar]	[Blue bar]											
Product Data Model (Draft)	84.00	1/5/09	4/30/09					[Red bar]	[Blue bar]											
Data Dictionary Model (Draft)	84.00	1/5/09	4/30/09					[Red bar]	[Blue bar]											
Grammar Options Outlined	84.00	1/5/09	4/30/09					[Red bar]	[Blue bar]											
PDS Standards Reference (Outline)	84.00	1/5/09	4/30/09					[Red bar]	[Blue bar]											
Review and Comment by Tech Group (Tech	1.00	5/4/09	5/4/09						[Blue bar]											
Data Dictionary Model (Final)	109.00	5/1/09	9/30/09						[Red bar]	[Blue bar]										
Grammar Decision	109.00	5/1/09	9/30/09						[Red bar]	[Blue bar]										
PDS Standards Reference (Draft)	109.00	5/1/09	9/30/09						[Red bar]	[Blue bar]										
General Data Model (Final)	259.00	10/5/09	9/30/10								[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]						
Product Data Model (Final)	259.00	10/5/09	9/30/10								[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]						
PDS Standards Reference (Final)	259.00	10/5/09	9/30/10								[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]						
PDS Data Dictionary (Content)	259.00	10/5/09	9/30/10								[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]						
P2. Distributed Infrastructure Project	586.00	11/21/08	2/18/11					[Red bar]												
Implementation Plan	20.00	1/5/09	1/30/09																	
Technologies and Standards Identification	140.00	11/21/08	6/4/09					[Red bar]												
Phase I (Security, Registry, Dictionary, Report)	215.00	2/9/09	12/4/09						[Red bar]	[Blue bar]										
Requirements/Design	95.00	2/9/09	6/19/09						[Red bar]	[Blue bar]										
Implementation/Test	105.00	5/11/09	10/2/09							[Blue bar]										
Release/Deploy	45.00	10/5/09	12/4/09								[Blue bar]									
Phase II (Search)...	345.00	6/22/09	10/15/10								[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]						
Phase III (Search)...	180.00	6/14/10	2/18/11											[Blue bar]	[Blue bar]	[Blue bar]	[Blue bar]			
P3. Tools Project...	260.00	10/1/10	9/29/11																	
P4. Distributed Catalog System Project...	435.00	9/30/09	5/31/11																	
P5. Portals, Search and Distribution Project...	350.00	6/14/10	10/14/11																	
P6. Data Movement and Delivery Project...	661.00	1/29/09	8/11/11																	

What we said...

- Specific goals for PDS 2010 *
 - Simplified, but rigorous, archiving standards (PDS4) that are consistent, easy to learn, and easy to use
 - Adaptable tools for designing archives, preparing data, and delivering the results efficiently to PDS
 - On-line services allowing users to access and transform data quickly from anywhere in the system
 - A highly reliable, scalable computing infrastructure that protects the integrity of data, links the nodes into an integrated data system, and provides the best service to both data providers and users

* PDS 2010 Executive Summary, July 2008

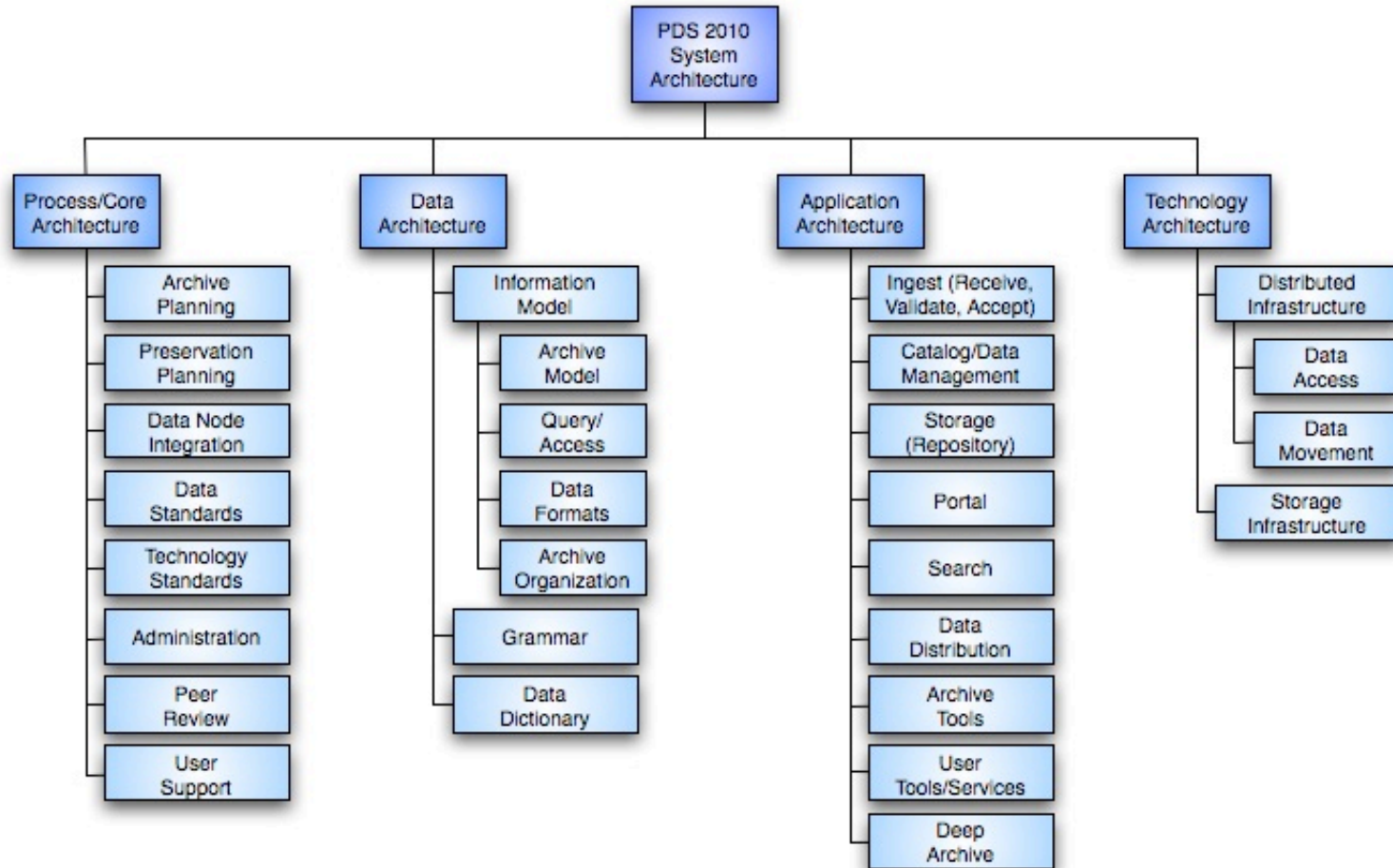
Summary of Progress

- After discussing the high level architecture in November 2008 for the data and system architecture with the MC, two project teams were created to focus on
 - Design and Definition of Data Standards
 - Design and Implementation of Distributed Service Infrastructure
- Both groups established an implementation plan and timeline consistent with the overall PDS 2010 project schedule
- Both teams hold weekly teleconferences and are marching through their projects plans
- Both teams have produced designs and have generated some tradeoffs that will be discussed today
- Long term, the plan is to begin releasing capabilities for review and to seed the PDS 2010 investment as we move through the rest of the FY

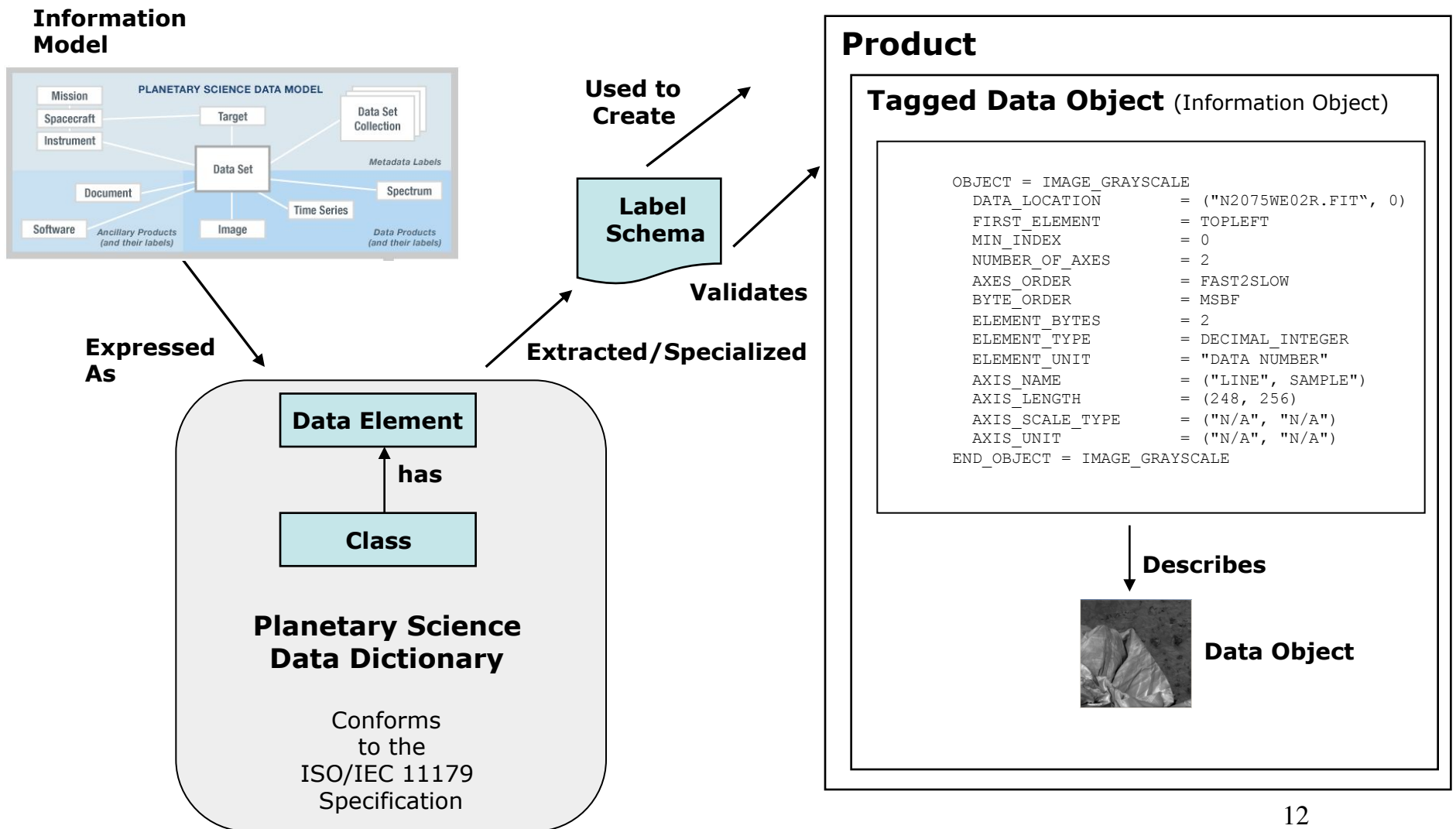
Key Architecture Decisions (as presented in Nov to MC)

- Move towards a software services model which allows for packaging and reuse of software as services over the network
- Develop a PDS4 model that encompasses both description of “data objects” and definition of data structure
- Identify opportunities to leverage newer standards, where appropriate
- We will now discuss the design, tradeoffs and impact at this tech session

Elements of PDS 2010



Data Architecture Concepts



Technical Architecture Concepts

- What do we mean by “software services”?
 - Software services are online, callable services that perform a function and return a result. They can be invoked over the network and can be shared.
- One of the primary focuses will be defining the “connectors” for the services
 - These will encompass some industry standard interfaces and some PDS-specific ones

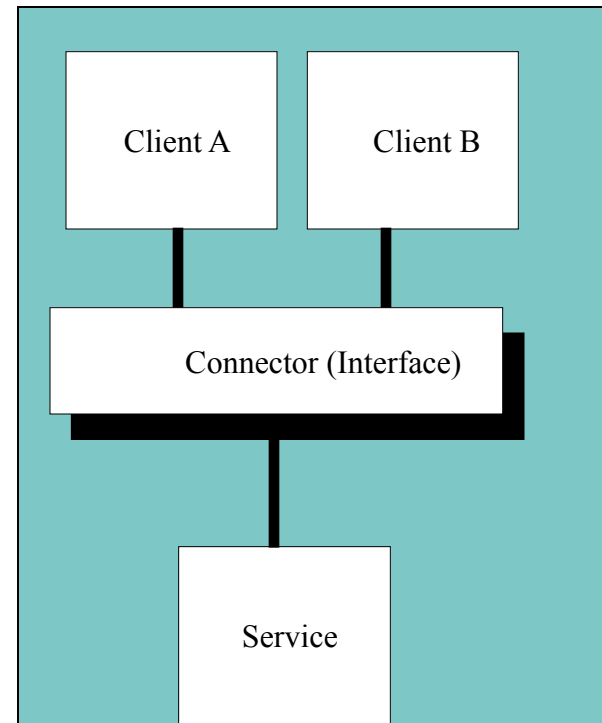
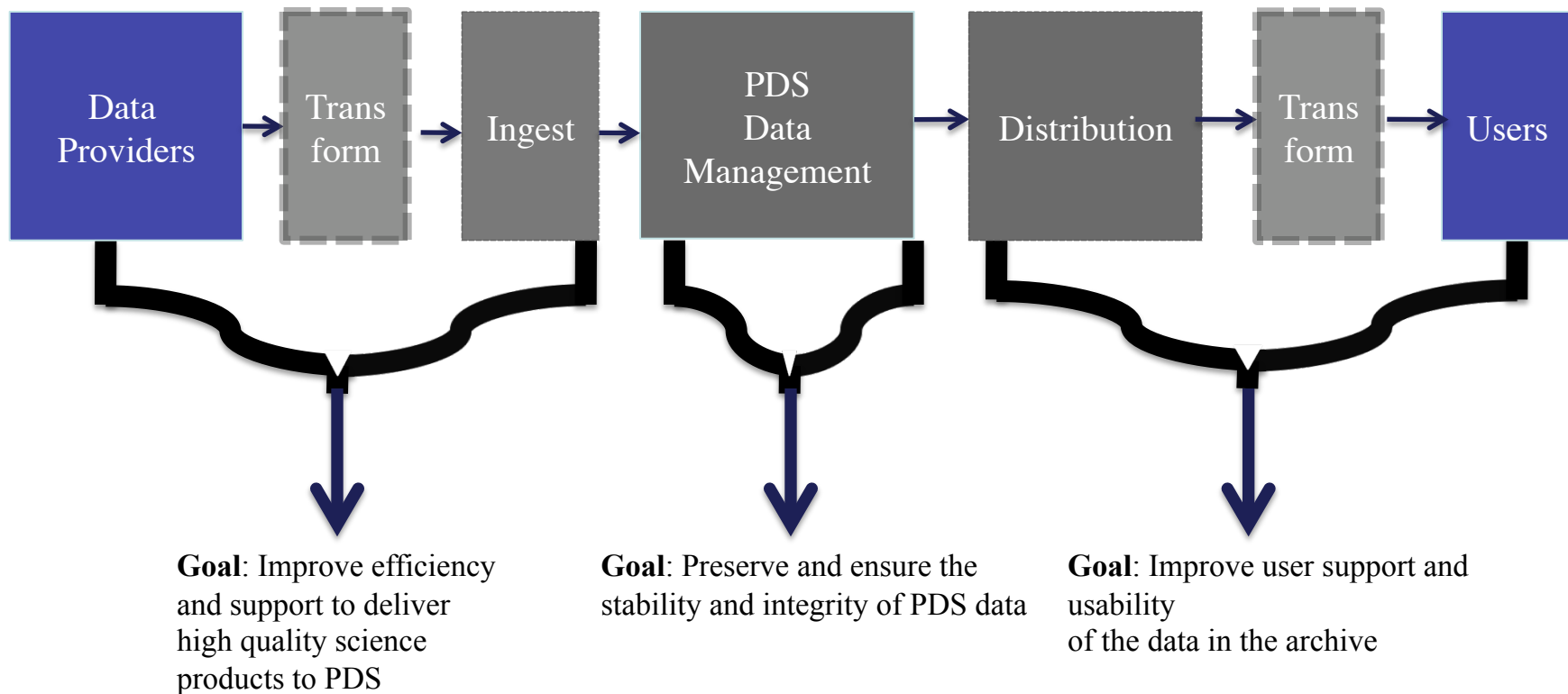


Figure – Component Connector Model (C2).

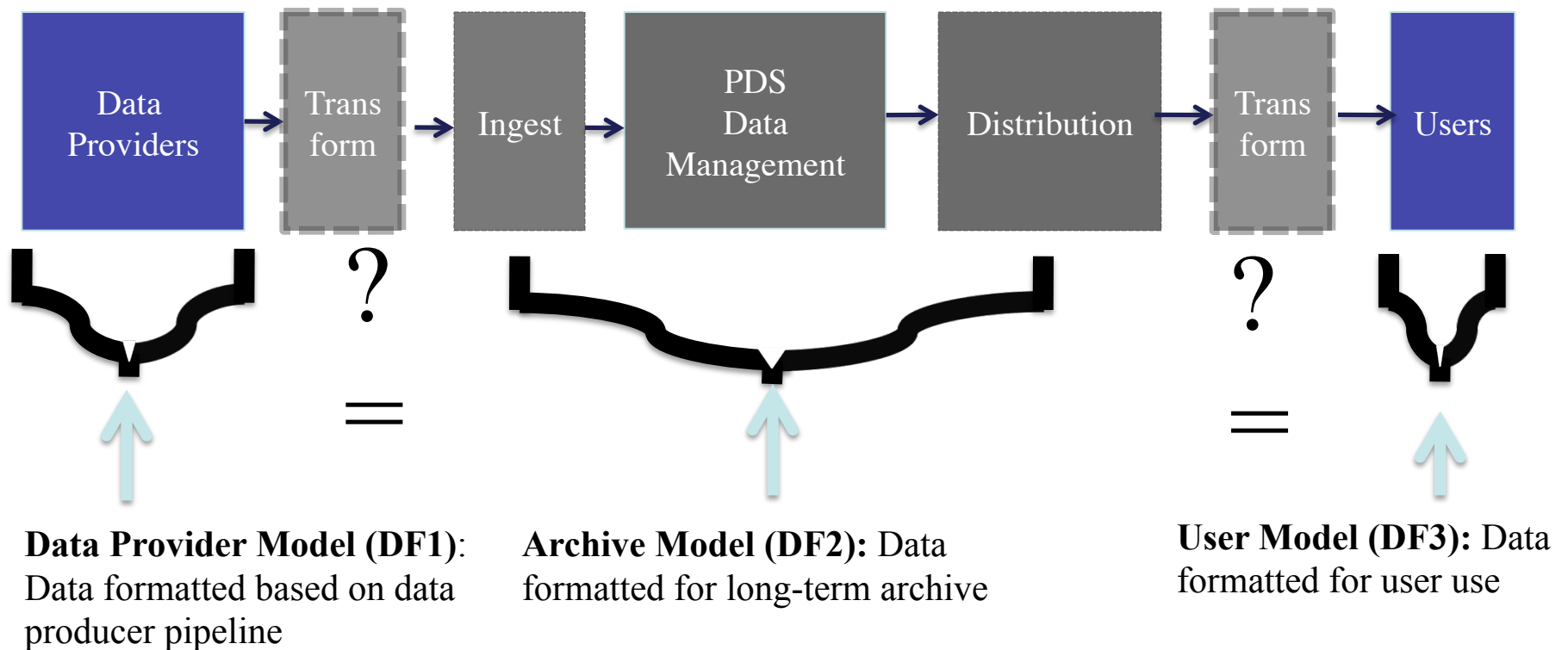
Focusing the Design

- Delivery to PDS
 - Provide data standards and software tools and services to improve the efficiency of delivery of high quality products to PDS
- Management within PDS
 - Preserve and ensure the stability and integrity of the PDS data
- Distribution from PDS
 - Provide software services, tools and standards to improve the usability of PDS and the data in the archive

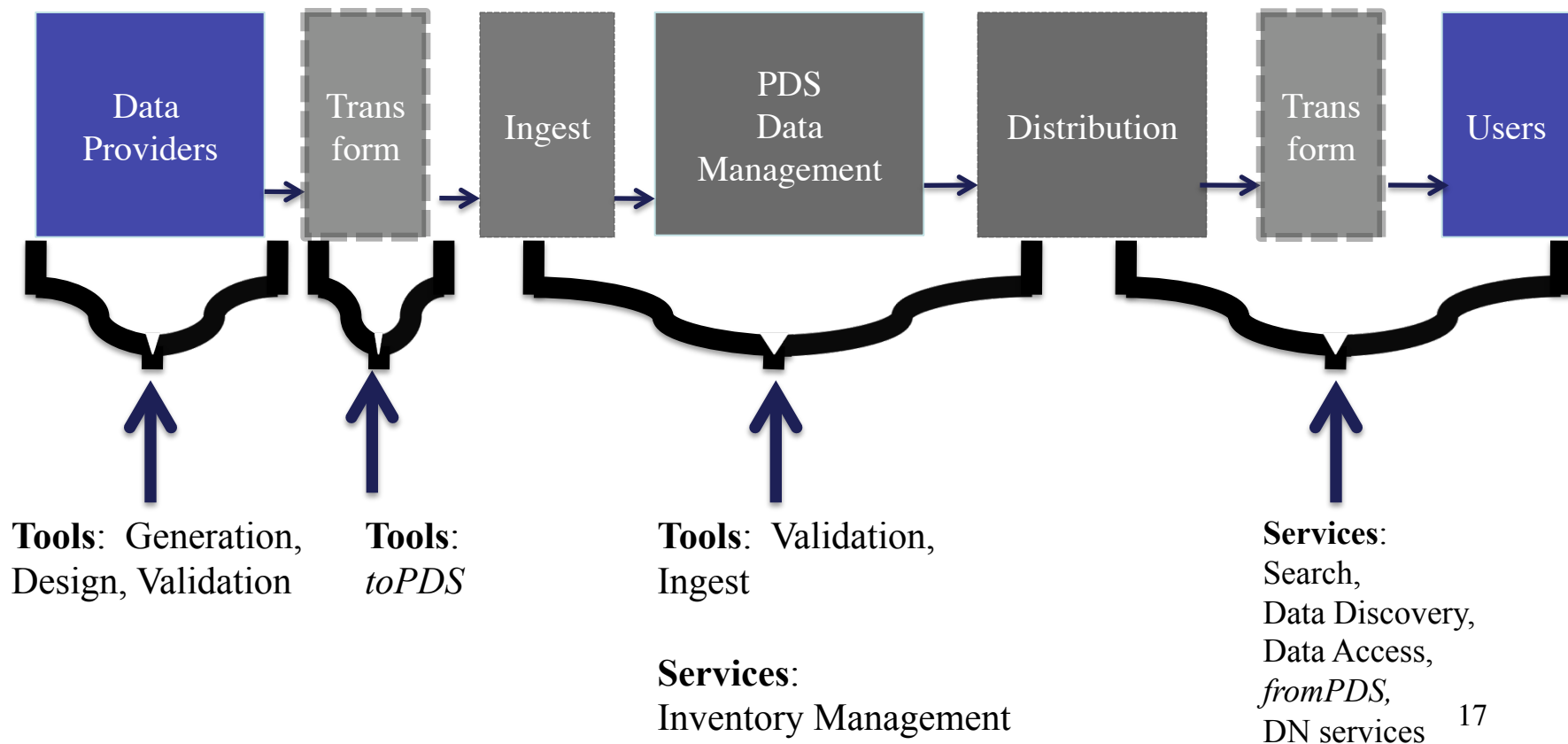
Level 0 Conceptual Flow



Level 0 Conceptual Flow (Data Model View)



Level 0 Conceptual Flow (Software Mapping)



Two Key Design Considerations

- Ensure the design of PDS allows for phased improvements over time to either/both ingestion and data distribution (e.g., delivery of data in user formats)

Rationale: PDS needs to be able to deliver capabilities in phases in order to manage both the operational and budgetary demands and limitations. This will tie all the way to the transition and impact discussion.

- Provide clear boundaries between “archive”, “user”, “data providers” for data, support and services

Rationale: Drives cleaner system designs and also allows us to understand the system in context

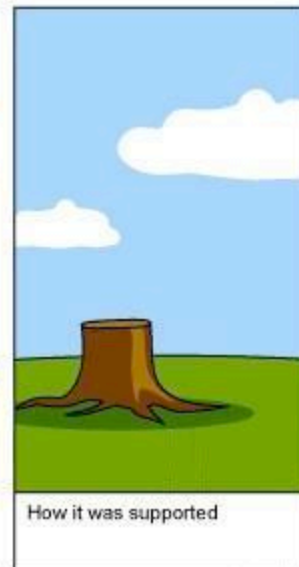
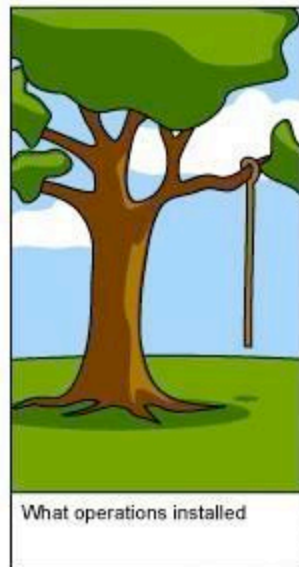
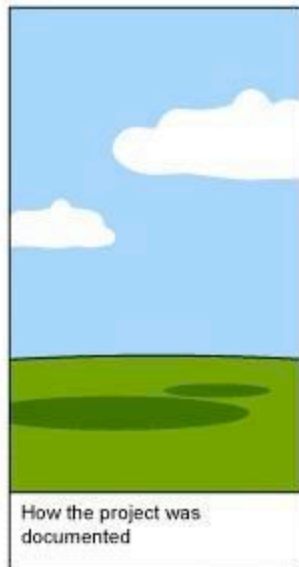
Critical Discussion Items

- PDS4 model, products and data formats
- PDS4 transformation concepts and options
- PDS grammar options (ODL vs XML)
- Generic and specific software services and their support for
 - Ingestion
 - Distribution (including search)
- Tool options and the plan to support PDS4
- Data dictionary support, standards, and services for PDS4
- Impacts and tradeoffs (see next slide)

Migration, Transformation, and Impact Discussion

- We'll discuss options for
 - Migration of existing data to PDS4
 - Transition of moving from the current system to a PDS 2010 system
- Impact of
 - Design, implementation and project decisions to PDS (DN/EN), data providers and users
 - Resources, training, usability and efficiency

Let's communicate...



Backup

Guiding Information for Design

- Roadmap
 - http://pds-engineering.jpl.nasa.gov/projects/PDS4/Exchange/PDS_Roadmap.pdf
- PDS Level 1, 2, 3 (System-Level)
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=5&cid=72>
 - Really, not a PDS3 set of requirements
- PDS4 Concept Papers
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=100&cid=119> (Architecture)
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=100&cid=120> (Data Model)
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=100&cid=121> (User Support)
- PDS Vision and Exec Summary
 - <http://pds-engineering.jpl.nasa.gov/projects/PDS4/pds2010-execsummary20080701.pdf>
- PDS 2010 Architecture
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=100&cid=131> (System Architecture)
 - <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=5&cid=125> (Data Architecture)