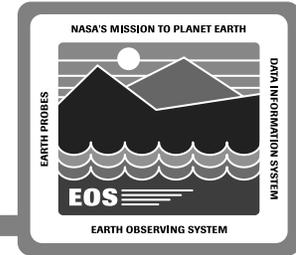


Planning and Data Processing

Parag Ambardekar

15 February 1995

Road Map for Planning & Processing Presentation



Overview

- ***Concept Drivers, Key Features***
- ***Production Management Flow***

Software Model

COTS/Prototypes

- **Evaluation**
- **OTS and Software Reuse**

Scenarios

Cross DAAC Scheduling/Planning

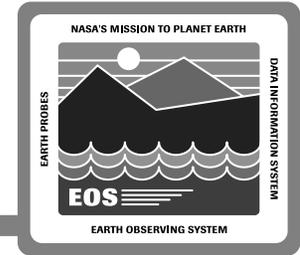
Other Data Processing CIs

- **AI&T Tools**
- **Science Data Preprocessing**

Hardware

Issues

Subsystem to CI Relationship



Planning Subsystem

Planning CSCI

Planning HWCI

Data Processing Subsystem

Processing CSCI

SDP Toolkit CSCI

Science Data Preprocessing CSCI

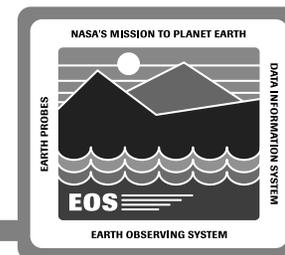
Algorithm I&T Tools CSCI

Science Processing HWCI

Algorithm QA HWCI

Algorithm I&T HWCI

Major Functions of Planning CSCI



Generates production plan

Manages Data Production

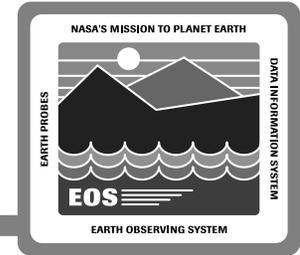
- **Monitors data arrivals**
- **Updates status**
- **Assigns priority**

Dispatches jobs that are ready for processing to processing queues

Provides capabilities to maintain and control the plan

- **GUI interface**
- **status messages (errors, logging etc.)**

Major Functions of Processing CSCI



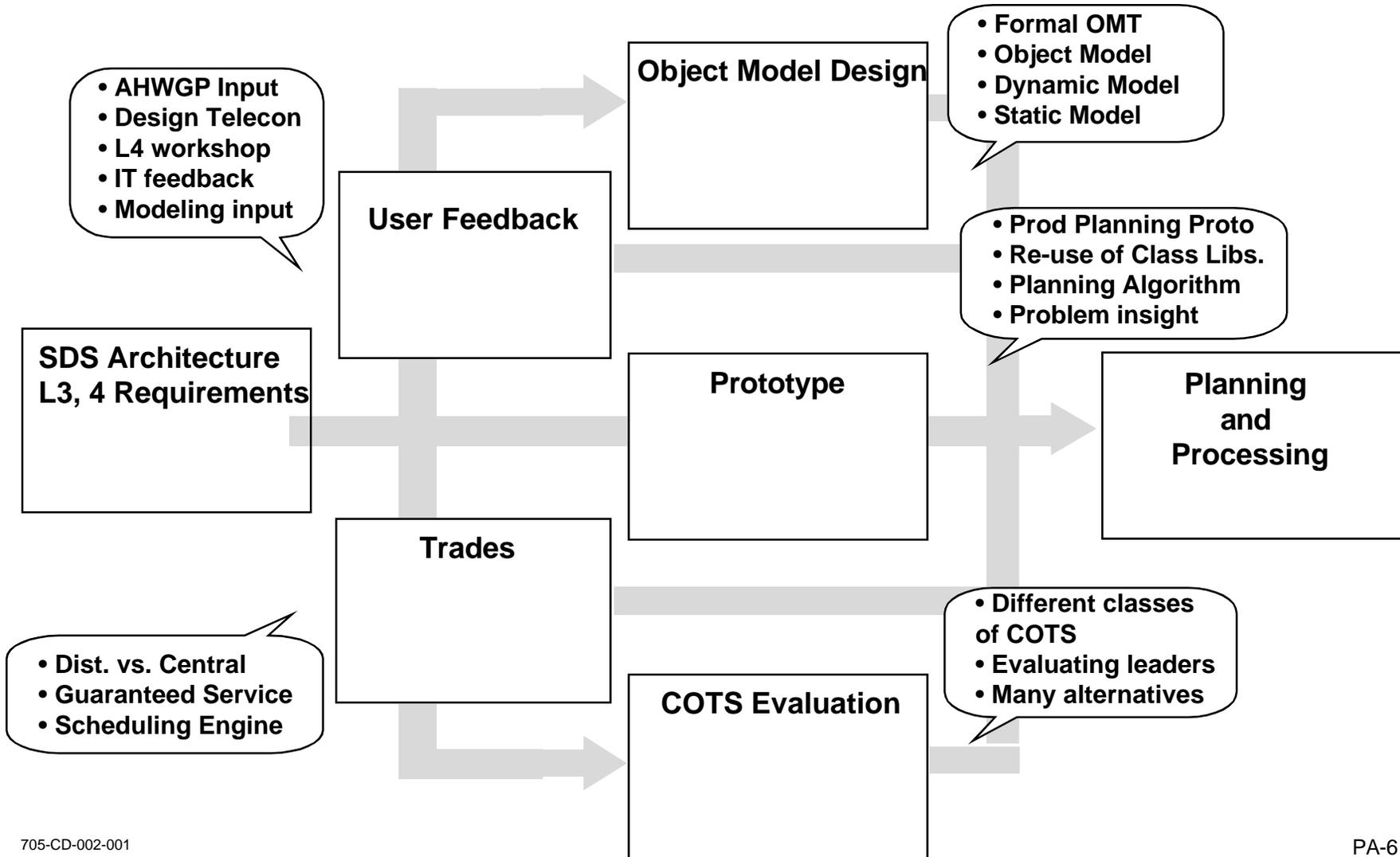
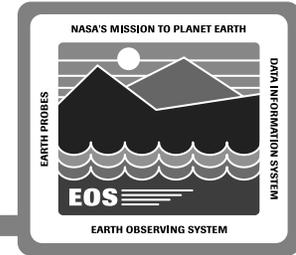
Performs Data Production

- provide input data for Science Software access
- executes Science Software
- provide output data for Data Server storage

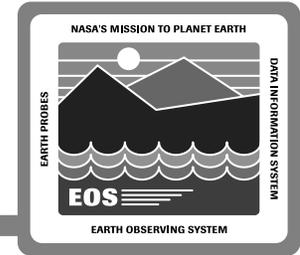
Provides capabilities to maintain and control the processing

- GUI interface
- status messages (errors, logging etc.)

Design Approach



Design Drivers



Data Driven product generation to increase automation

Schedule driven adjustments for flexibility

Support for activation rules identified by AHWGP

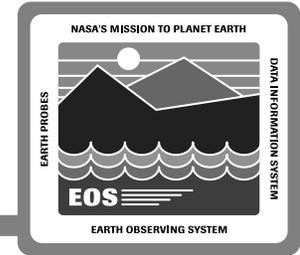
- Temporal coverage overlap
- New instance of product requires prior instance of same product
- M instances of process A run only when N instances of B complete
- Tessellation (mosaicing / spatial overlap)
- Alternative inputs
- Conditional activation based on metadata



A Support unstaffed shifts of DAAC operations

Efficient use of science data processing resources

Key Design Features



Client/Server relationship of Planning (client) and Processing (server)

Plan generation initiated by operator command

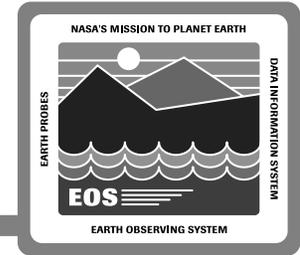
Initiation of processing jobs based on actual data availability

Production control shared between Planning and Processing

- **Planning monitors data arrivals**
- **Planning ensures input availability**
- **Processing controls resource allocation and execution**

Dynamic adjustment to deviations

Key Design Features (cont.)



Dynamic status update provided by Planning and Processing

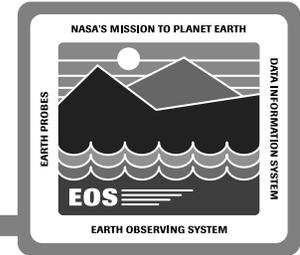
GUI to provide monitoring and control capability

Production Plan accessible from remote sites

Production Plan access control by user class/priority/security

Remote inputs for Production Plan modification possible

Key Definitions



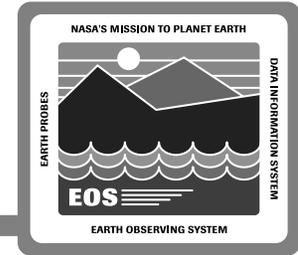
PR - Production Request; entered into Planning database; abstraction for requesting production to be performed which can generate multiple DPRs (standard, reprocessing, and on-demand)

DPR - Data Processing Request; generated by Planning software based on Production Requests; one DPR requests one PGE to be executed

Candidate Plan - generated by Planning software as potential active plan

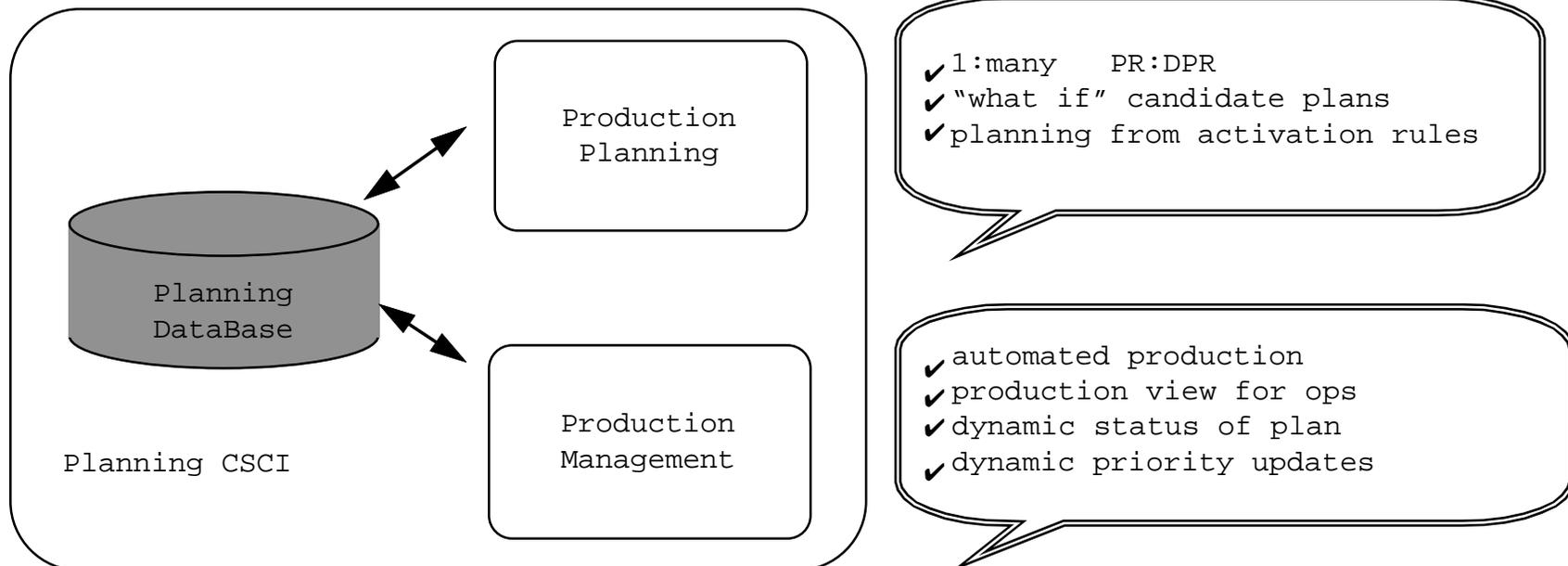
Active Plan - selected from candidate plans as current plan being implemented

SDS Planning Concept

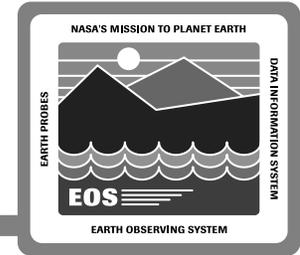


Reminder:

- **Production Planning generates candidate plans from planning data**
- **Production Management orchestrates production**

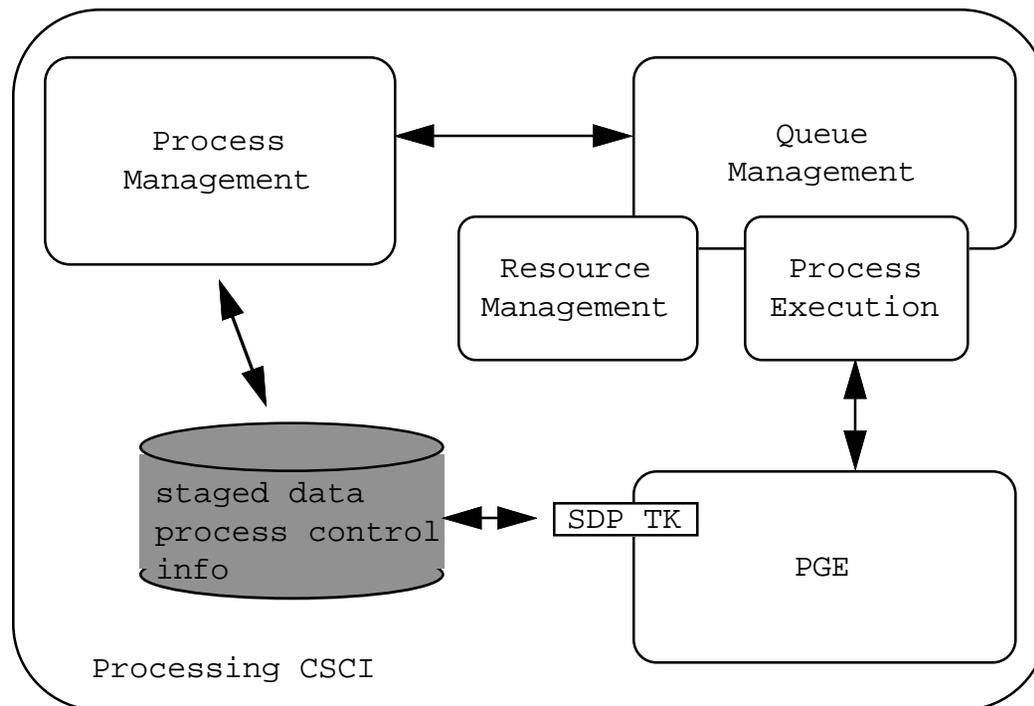


SDS Processing Concept



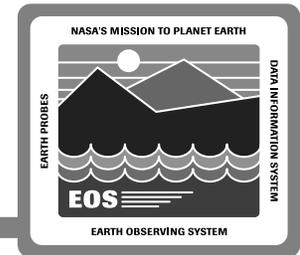
Reminder:

- **Process Management** coordinates production with planning
- **Queue Management** optimizes local processing



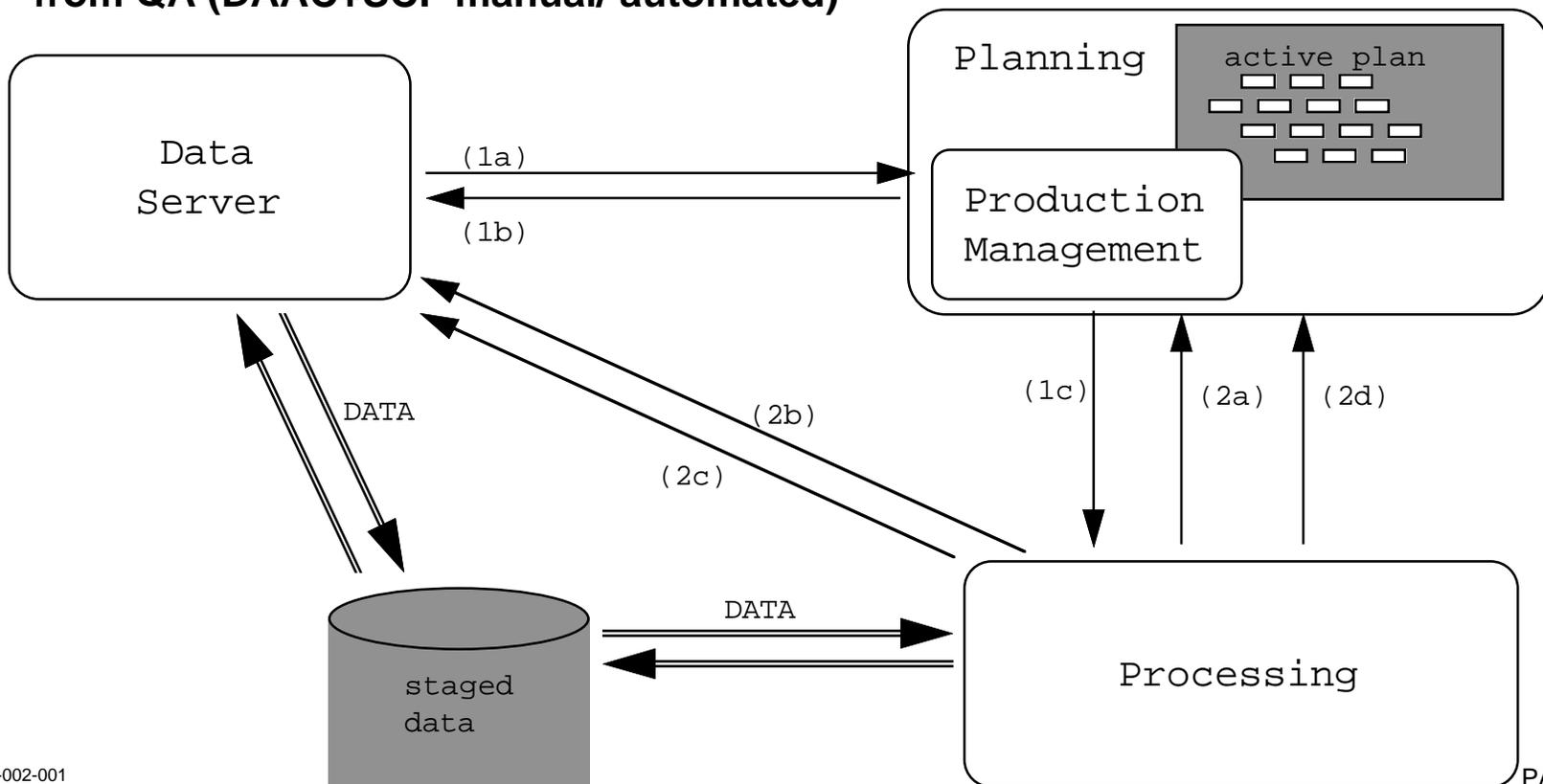
- ✓ automated production
- ✓ status feedback to planning
- ✓ fault and error management
- ✓ dynamic queue/priority adjustments

Basic Production Management

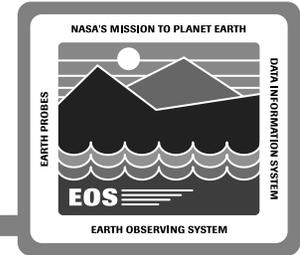


Core scenario is repeated to support processing of data:

- from ingest,
- from on-site,
- from off-site,
- from QA (DAAC+SCF manual/ automated)



Basic Production: Scenario



Start Point: Plan defined for standard production and activated

- **Management of production**
 - **1a) Subscription notice received from data server (L0 data available from ingest DS) Comparison of data ID with items in plan**
 - **1b) Query of data server for associated metadata Production decision**
 - **1c) When all required data are available, send Data Processing Request (DPR); specifies PGE, input granule info, output granule info, processing parameters, resource info**
- **Data Processing**
 - **2a) Data Processing Request is acknowledged; DPR is converted to job description; job queued**
 - **2b) data staging request for data (and acknowledgment); job executed**
 - **2c) data destaging request (and acknowledgment)**
 - **2d) Status updates are reported to plan**
- **Higher Order Production**
 - **3) Basic repeat pattern for subsequent production items (e.g., higher order products)**