



Space Technology Mission Directorate Game Changing Development Program

GCD Digital Operations and Transformation (DOT)

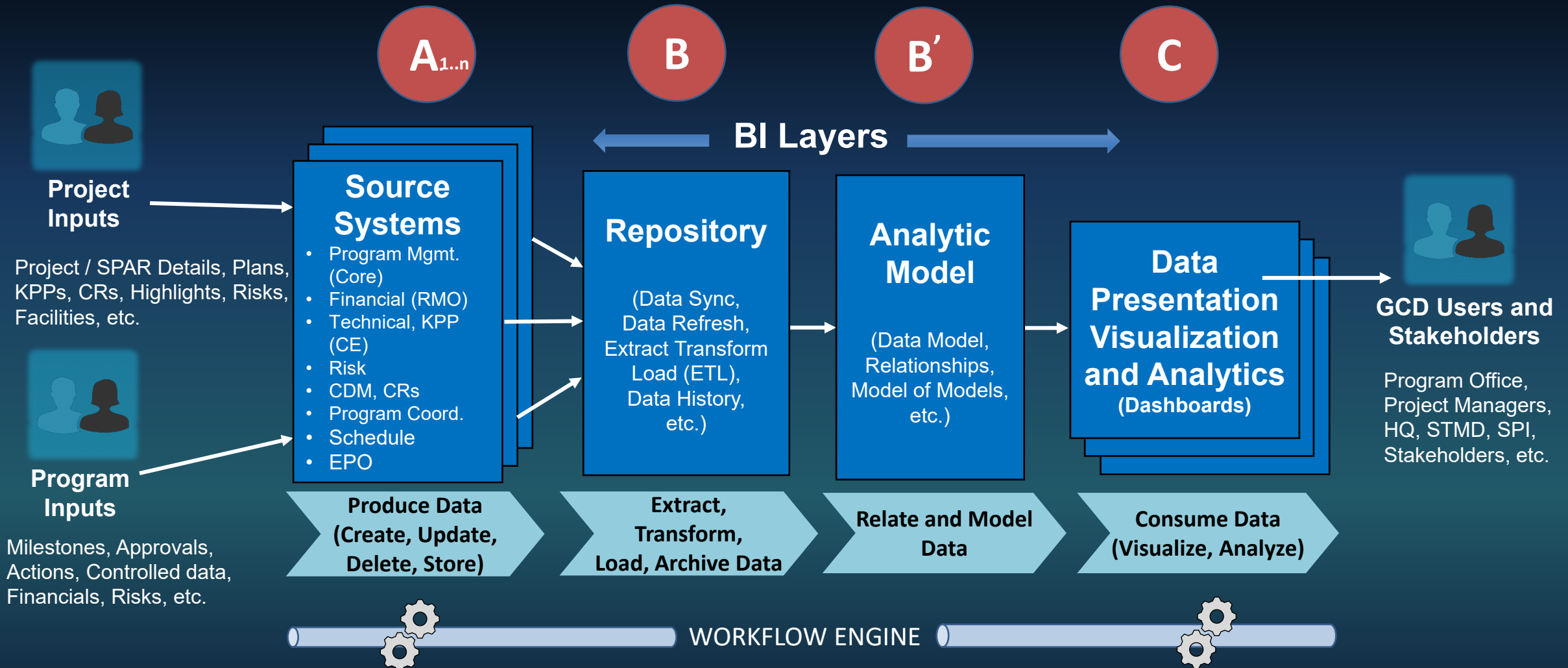
Wade May, Daniel Yoo, Chris Munk, Dan Friedrich, Jozef Newsome
September 2023

**PLEASE HAVE YOUR NASA LAPTOP AND PIV BADGE
WITH YOU FOR THIS INTERACTIVE SESSION**

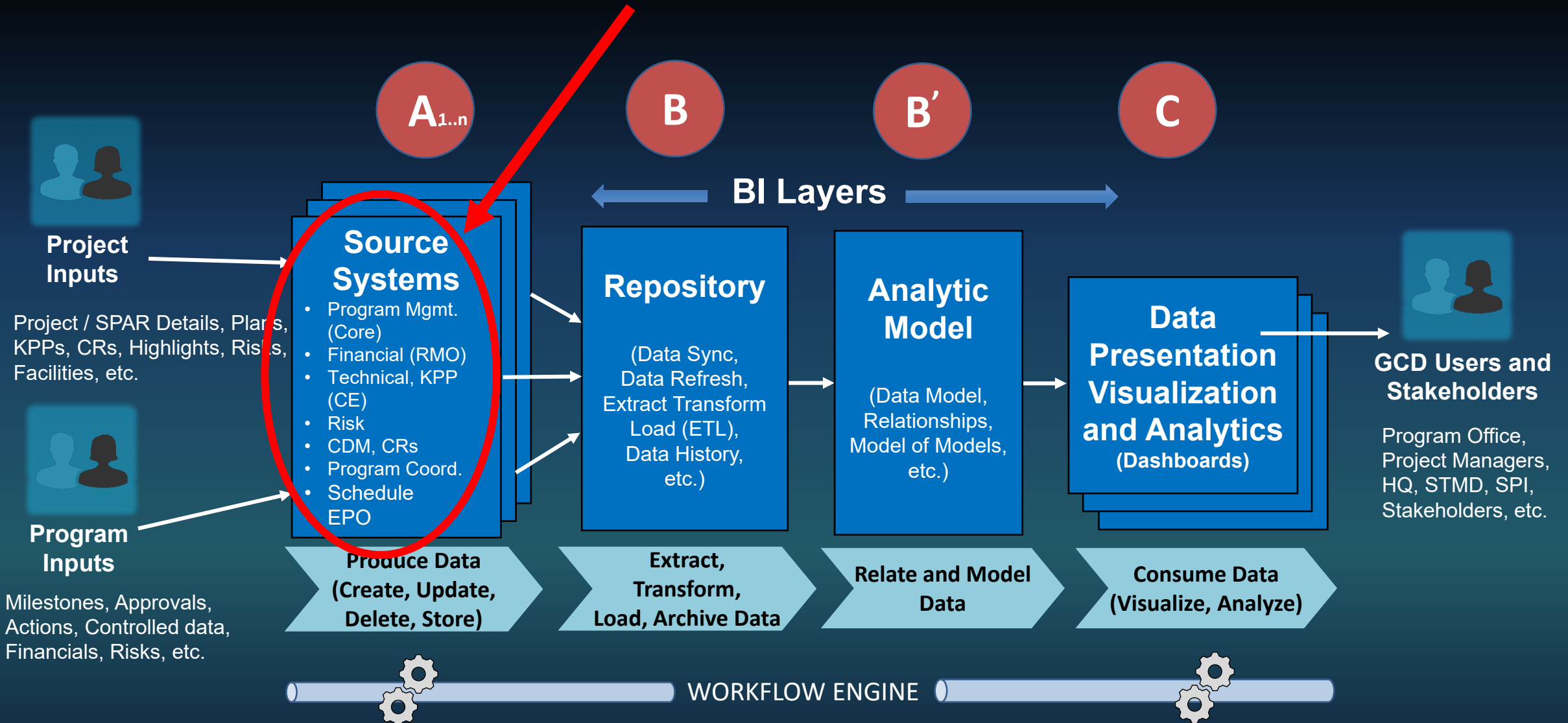
GCD MBPM “Desirements”

- MBPM solutions for all GCD processes, products, and HQ reporting
 - **Instantaneous real-time updated data for all technical activities** in a secure, cloud-based, Agency-supported solution
 - Coordination tools and a **comprehensive data model** ensure data is synched from a single, yet distributed, initial authoritative source
 - Flexible and customizable **data visualization** of technical reporting for various management levels and stakeholders
 - Real-time project performance **analysis** (e.g. Technical, Resource allocation)
 - Intelligent Programmatic Requirement Development, Control and Presentation
 - “Control the data not the documents”
 - Program risk management analysis and reporting

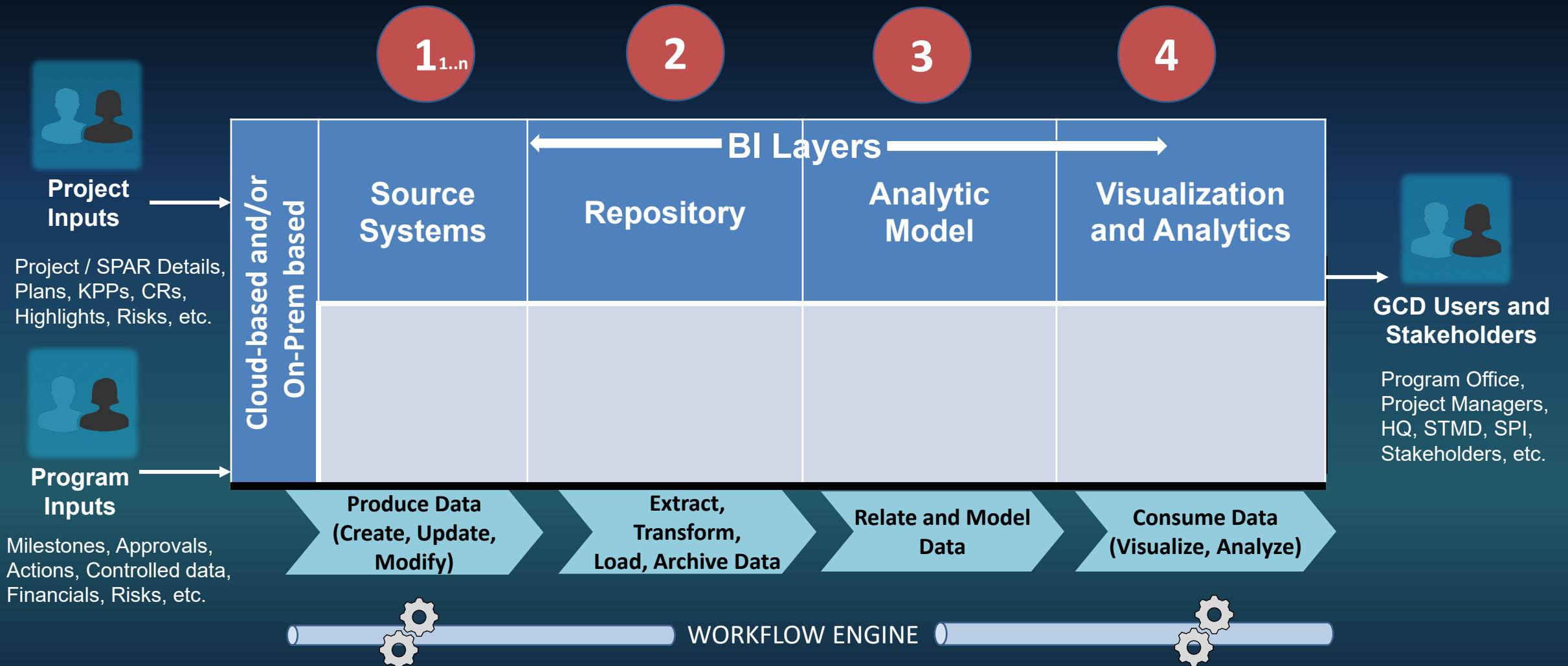
GCD DOT Functional Architecture (The ABCs)



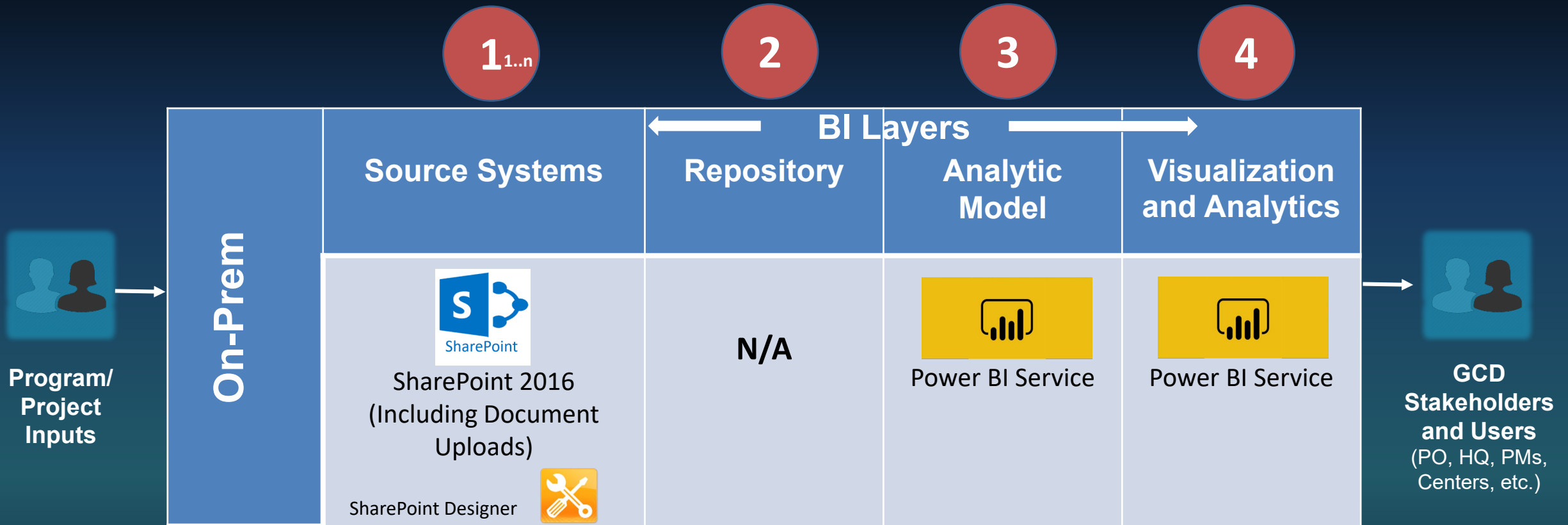
GCD Information Domains (Datasets)



GCD DOT Technical Architecture



GCD DOT Current Architecture



GCD DOT Desired Architecture



1_{1..n}

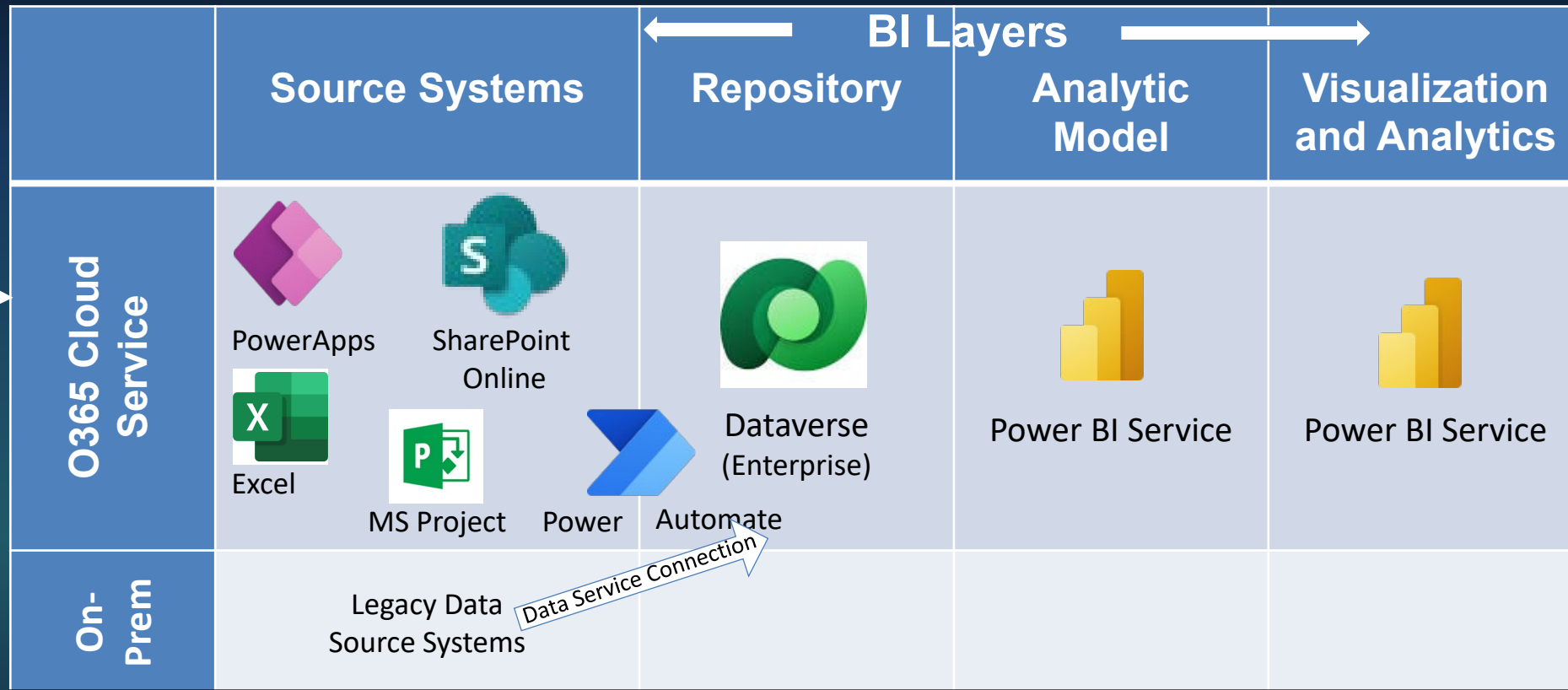
2

3

4

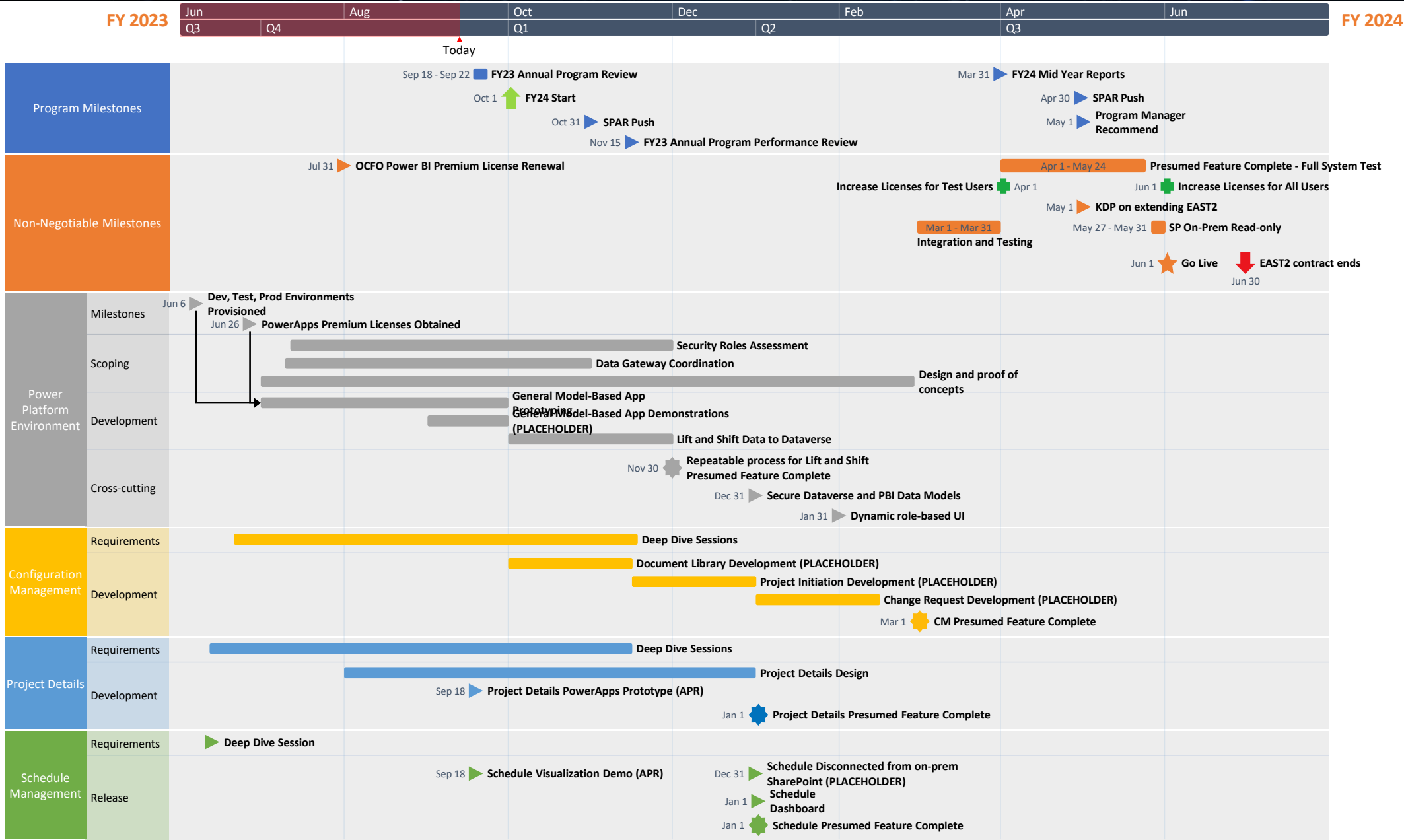


Program/
Project
Inputs



**GCD
Stakeholders
and Users**
(PO, HQ, PMs,
Centers, etc.)

Cloud Transition Roadmap



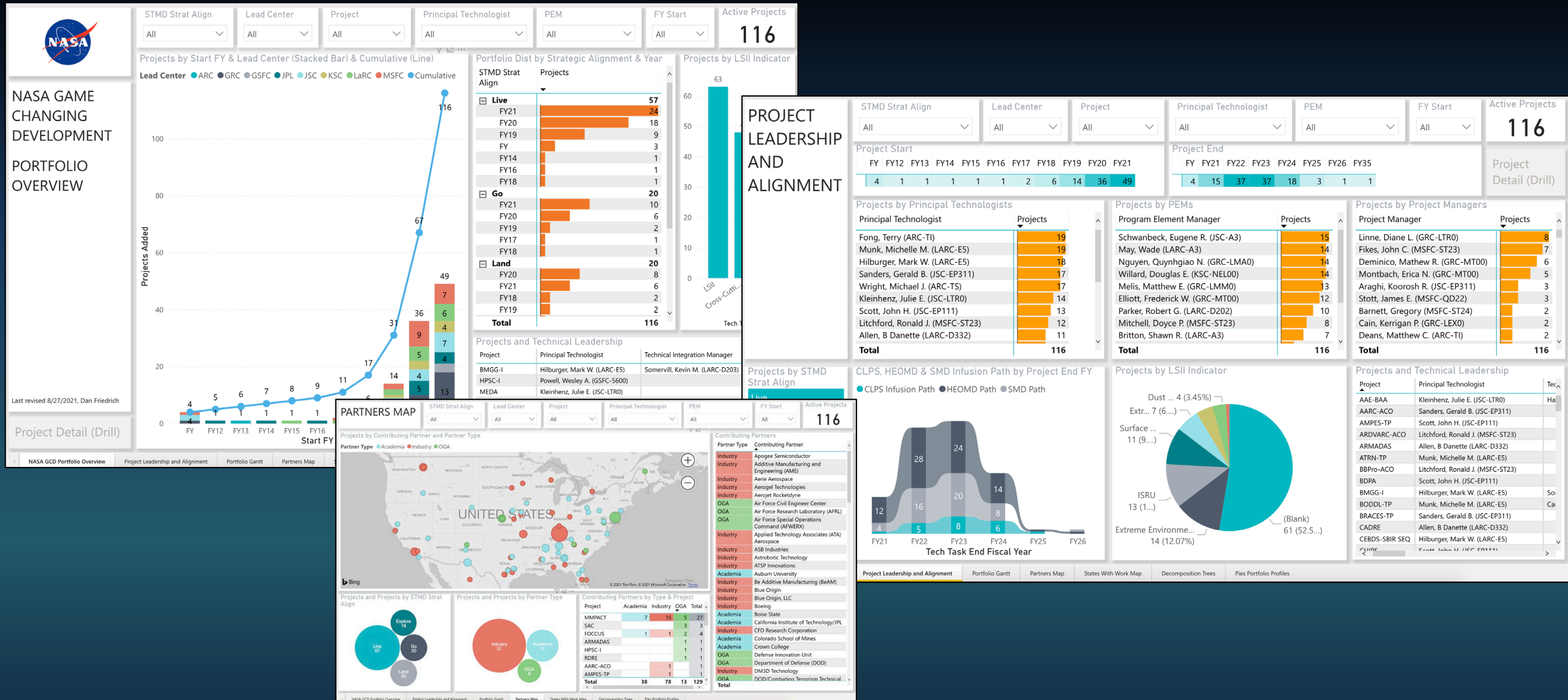
NOTIONAL



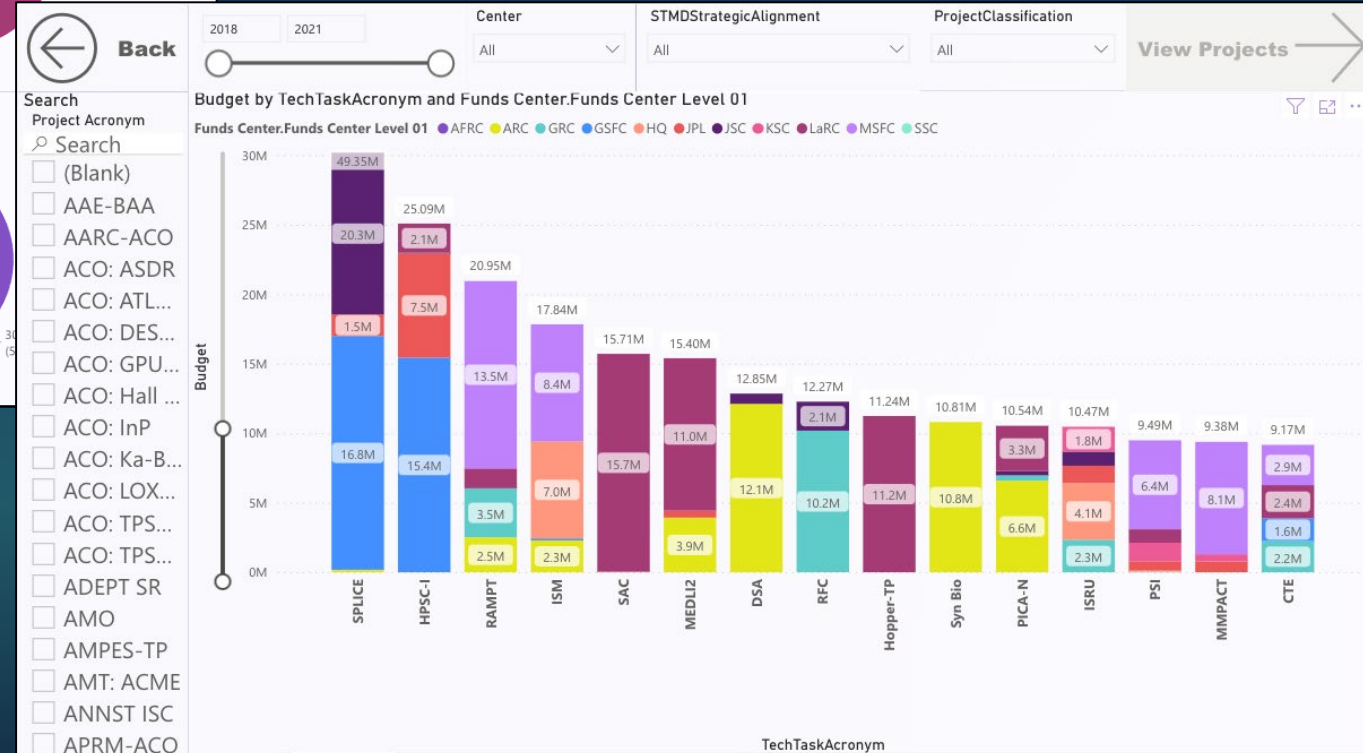
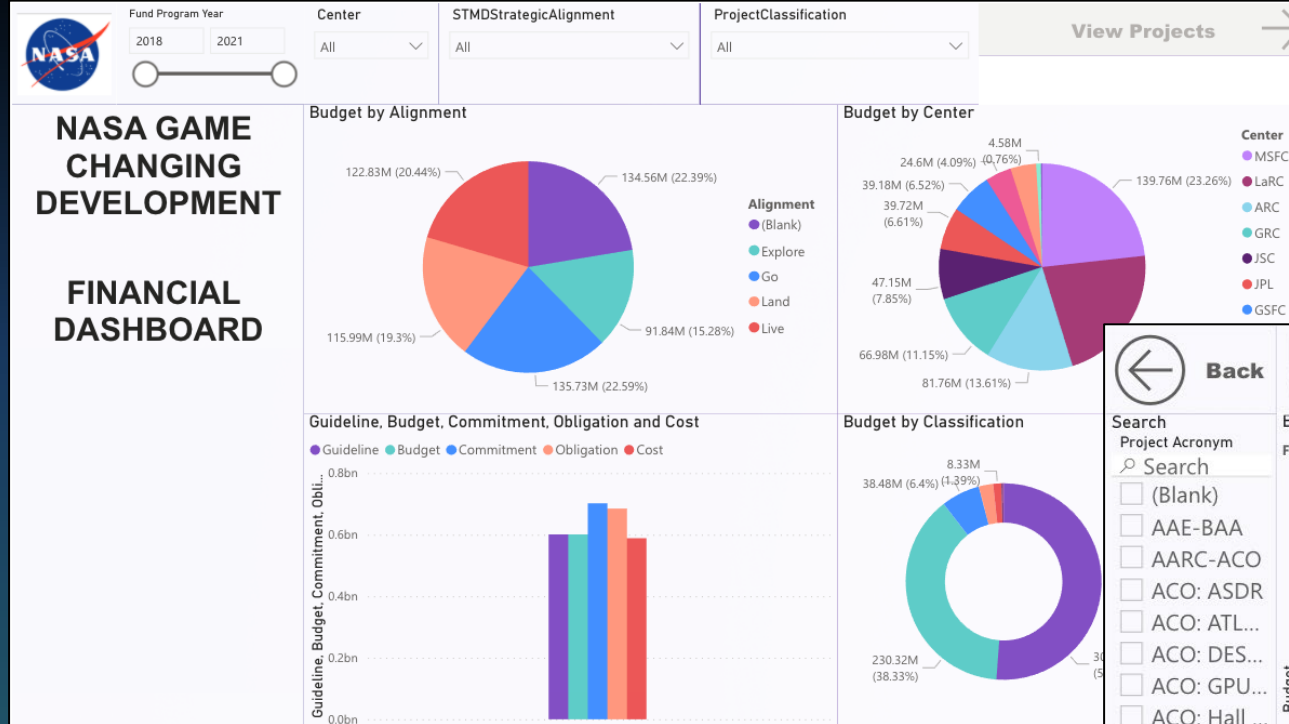
Existing Tools

**GCD Portal Team
for
Links to all tools**

Program Analytics Dashboard



Financial Dashboard (NOT OFFICIAL RECORD)



Key Performance Parameter PowerApps

Power Apps | KPP PowerApp

LuNaMaps

In-Work

Complete

All

Discontinued

Candidate

KPP UID	Parameter Name	Unit	State of the Art	Threshold	Goal	Current Value
274	Improved accuracy of polar LOLA altimetry	meters (m) ...	(6) 7.0 / 1.0	(4) 2.0 / 0.3	(2) 1.0 / 0.15	(2) 1.0/0.15
275	Improved coverage of cleaned polar LOLA DEMs	meters/pix...	(6) 4 regions of i...	(4) 20 additi...	(2) 87 – 90° S ...	(2) 87 - 90 S @ 5mp...
276	Minimize local map distortion for 2.5mpp DEM/albedo maps	meters erro...	(6) N/A	(4) less than ...	(2) less than 4...	(4) less than 8m at 2k
277	Develop a benchmark set of synthetically enhanced DEMs	Number of ...	0	1	4	2
278	Process for V&V of map products and simulation environments	N/A	(6) There are cu...	(4) Define a ...	(2) LuNaMaps...	(6)

Updated Current Value

(2) 1.0/0.15

Updated Date of Entry

9/7/2023

Current Value Verification Meth...

Analysis

Current Value Source Artifact

TAPR presentation

Next KPP Milestone Date

8/18/2023

Next KPP Milestone

Comments

goal met at TAPR - propose to close.

Value Type

Enumeration

FY Close-Out

FY24

Value Trend

Decreasing

Project Plan

Project Content Document: GCDP-02-PCD-21017

KPP Verification Method

Analysis

State

In Work

Achievement

Below Threshold

Submit

Project Manager Stoplight PowerApps

Stoplight Report - Excel - PowerApps

https://apps.gov.powerapps.us/play/e/default-7005d458-45be-48ae-8140-d43da96dd17b/a/eb1d3a28-07f4-48a2-84ea-276dcde49071?tenantId=7005d458-45be-48ae-8140-d43da96dd17b&source=email&hint=6216d8d9-10c3-4cc2-9619-482f0965d4fb

Power Apps | Stoplight Report - Excel

Share

V 0.5.23.9.1

Project Stoplight Report

Information

Project: DSS

Cost	Schedule	Technical	Programmatic
Green	Green	Green	Green
No issues.	Partner project's test started in February. Approximately 5 weeks of testing has been completed, with at least 2 more weeks of testing planned.	No issues.	Budget is \$550K for FY23.

Submit

Project Details / SPAR PowerApps

Power Apps | GCD Portal

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Change Requests

GCD SharePoint Site

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Lookup Tables

208 - Saved Project

Tech Port (Public) | Project Details (Non-Public) | Leadership | Partners | Change Requests | Related

Overview

SharePointID: 208

Project Acronym: _TEST_REV A

Project Title: _TEST_REV A

Technology Overview: Test UAT Migration 032121
Test 032221
Test 032321test
Test JN 041221 Test 1
Daniel Test 060721
Daniel Test 060821
Daniel Test 061421
Daniel Test 2 061421
Daniel Test 061521

Benefits: The activity lowers the risk for the first high-temperature mid- scale nozzle test on the BE-7 engine knowledge of high temperature composites for nozzles.

- Potential for 50% reduction in mass (weight) versus that of comparable metallic or ablative nozzles
- Improvement in thermal margins versus that of comparable metallic nozzle extensions.
- Reductions in overall costs are possible with composite nozzles
- Potential use of state-of-the-art coatings and mixed and/or inhibited matrices may further reduce costs
- test
- test-bindu-test
- DY testing 090320 11:31 AM
- DY test 100620
- Jozef Test 10-14-20

208 - Saved Project

Tech Port (Public) | Project Details (Non-Public) | Leadership | Partners | Change Requests | Related

Tech Port (Non-Public)

Technical Facilities: ---

STMD Strategic Alignment: Go

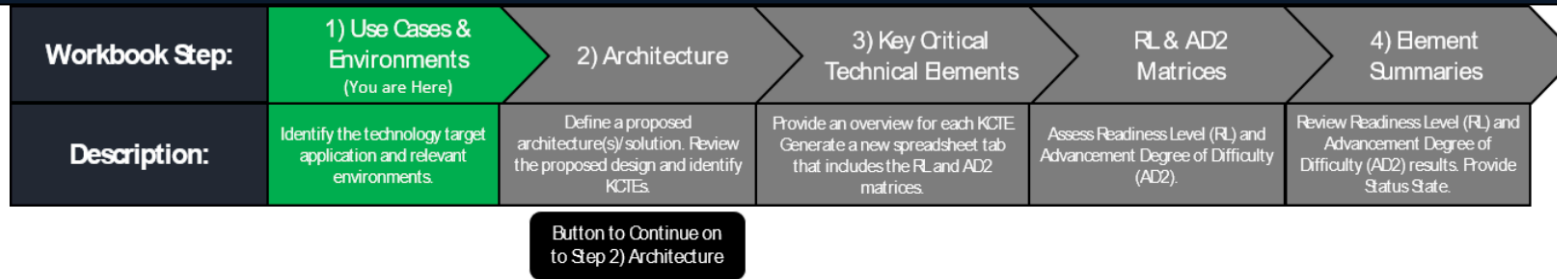
GCD Internal

Project Classification: Small Business Innovation Research (SBIR)

Releasable Description: ---

Current State of the Art: Extreme-temperature carbon- and ceramic-matrix composite nozzle extensions (CNE's) for liquid rocket engines are currently under development by NASA. Prior History: A lack of liquid engine application opportunities and the associated high costs of developing, qualifying, and certifying new nozzle extensions, there was subsequently the SLS Program) initially baselined a C-C nozzle extension for the J2-X engine. Ultimately, the Constellation/SLS J2-X engine development performed for the J2-X engine program helped generate significant interest in CNE approaches. Additionally, more recently, the substantial growth in the acceptance of the potential significant advantages of CNE's over metallic and ablative options has also improved significantly, with most systems applications, composite component sizes, and composite materials available have all increased substantially. The range in high-temperature composite materials (ACM's) pintle valves and the Nuclear Thermal Propulsion (NTP) nozzle extensions (see Figs. 5 and 6, respectively). The Orion LAS ACM pintle valve size to that of the J2-X engine CNE,testingtesting

Technical Readiness Assessment Insight Tool (TRAIT)



Project Information							
Program Acronym	Project Acronym	Sub-Project Acronym (If Applicable)	Primary Technical Taxonomy	Primary Technical Taxonomy Level 2	Primary Technical Taxonomy Level 3	Additional Technical Taxonomy	Secondary Additional Technical Taxonomy

Button to Hide/ Unhide Reference Mission

(Relevant Environments Identified as "Yes" for Bounding Case*)

Cell Color Coding
Type Input in Cell
Do Not Edit Cell
Cell Includes Drop-Down List
Environment Identified as Applicable

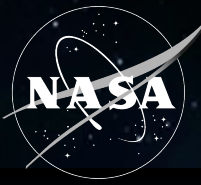
[illegible]



Planned Tools

Monthly Reporting

Convert from PowerPoint to Power Platform



PowerPoint

LIRA



Project description: Laser In situ Resource Analyzer (LIRA) is a spectroscopy instrument for analysis of ISRU propellant streams **Current TRL: 3**

Cost: Q1 Q2 Q3 Q4 G G G G Monthly Trend **Schedule:** G G Y G Monthly Trend
 Project spending is on track (labor and procurements) COVID-19 case surge led lab work to be suspended, delaying testing and validation of optical designs by 1 to 2 months

Technical: Q1 Q2 Q3 Q4 G G G G Monthly Trend **Programmatic:** G G G G Monthly Trend
 Completed component-level environmental testing of lasers and reference cells (shock, vibration, and thermal cycling) Updated Project Plan and Technology Assessment package submitted to GCD Program
 Completed optical breadboard and performed end-to-end spectroscopy testing Project Tabletop CDR/TAPR scheduled for June 28, 2021

PowerApp/Automate/BI

Project Name (Acronym)



Cost Status
 Project spending is on track (labor and procurements)

Schedule Status
 COVID-19 case surge has led lab work to be suspended, delaying testing and validation of optical designs by ~ 1 month to date

Technical Status
 Prior to suspension of lab work, a prototype of the LIRA long-path optical cell was used to collect water absorption measurements with down to 50 ppm(v) H2O concentration
 Additional laser packages and pressure sensors have been received and are ready for

Programmatic Status
 Next major review is CDR, tentatively scheduled for April 2021

Project Highlights/Accomplishments



Title	Type	Element	Description	New Image for EPO	Highlight Submitted
Completed laser and reference cell environmental testing	Project Milestone	Laser/Optics	Tested custom-packaged semiconductor lasers with collimation optics and reference cell for thermal cycling, random vibration, and shock	No	No
Completed optical breadboard demonstration	Key GCD Milestone	Integrated system	Successfully performed end-to-end three-channel spectroscopy testing using breadboard model of LIRA spectrometer	Not yet!	Not yet!

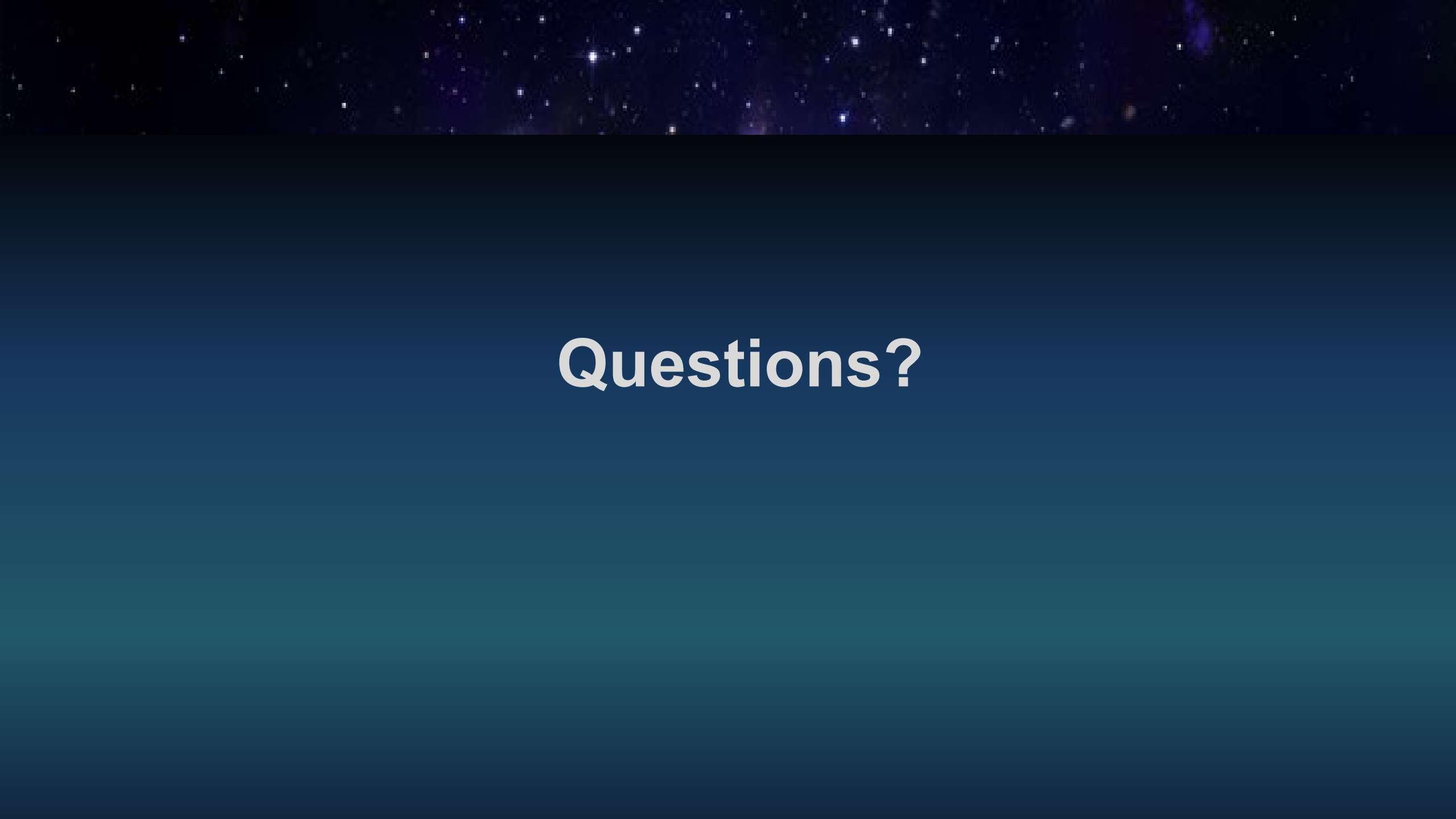
Project Highlights/Accomplishments



Accomplishment Index	Title	Type	Element	Description	New Image for EPO	Highlight Submitted
1		EX: § Milestone § EPO § Test § Agreements / § Contract § Awards § ETC.	Specific Facet of a Portfolio Project Others - mapping to Tech Assessment/ Tech Element/ Tasks		Yes It is on he Project Overview slide No	Yes No Will submit one on XX/XX/XX
2	§ Provide a title for the accomplishment					
3	§ Element – Portfolio Project: Specific Facet. Other: Map to Tech Assessment / Tech Element / Tasks					
4	§ Type – Milestone, EPO, Test, etc.. Provide your					

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Questions?