

Pyramid Analytics

response to

NASA Science Mission Directorate (SMD) RFI

for

**Open Sourced Science (OSS) for Earth System
Observatory (ESO) Mission Science Data
Processing Study**

Submitted on February 1st 2022, By:

Joe Fritsch
Director of Federal Sales
joe.fritsch@pyramidanalytics.com
(571) 415-3116

<https://www.pyramidanalytics.com/>

Pyramid Analytics is a Large business (SAM UEI: LCZ1WG4E4LM1, DUNS: 019782647) and our products and services can be purchased via several federal resellers that hold various government contracts including SEWP V, NITAAC CIO-CS, Army CHES ITES-SW2, and Seaport NG. Our products are also available in the AWS Marketplace and can be run in AWS Govcloud.

TABLE OF CONTENTS

1. Introduction	1
2. Pyramid Analytics	1
3. Data Processing System Architecture.	2
4. Open Science.....	4
5. Component Technologies.	4
6. Downstream Interoperability.	5

1. Introduction

Pyramid Analytics is pleased to provide this response to the Request For Information for *Open Sourced Science (OSS) for Earth System Observatory (ESO) Mission Science Data Processing Study* issued by the NASA Science Mission Directorate (SMD) and the Jet Propulsion Laboratory (JPL). We believe that the Pyramid Analytics modern decision intelligence platform can be used by SMD and JPL as a key component in the mission science data processing architecture as it provides the full range of modern Data Analytics, Data Science, Data Wrangling & Machine Learning capabilities necessary to support analysis of the vast amounts of ESO mission data. The Pyramid Analytics Decision Intelligence Platform provides a COTS modern data analytics platform that will allow NASA data scientists and other citizen data scientists to collaborate on Open Science and to achieve NASAs goal to create a holistic view of Earth leveraging data collected across the full spectrum of ESO missions.

2. Pyramid Analytics

Pyramid Analytics is a recognized innovator in business analytics. The Pyramid Decision Intelligence Platform unlocks the strategic value of enterprise data for everyone in the modern workforce. Only Pyramid unifies Data Preparation, Business Analytics, and Data Science in a single Analytics and Business Intelligence (ABI) environment. The result is a modern enterprise analytics platform that enables everyone in your agency to make better, faster decisions based on the same trusted information. For Data Leaders, Pyramid provides the fastest, most successful path to aligning business needs with your enterprise data strategies. You can rein in BI chaos—the dueling spreadsheets, siloed desktop tools, and static reports—with a complete enterprise platform that extends the reach and value of analytics across your entire company. For Everyday users, analysts, power users, data scientists, and business users love Pyramid because they’re free to ask their own questions and find their own answers—at the time and speed they need. People can do, share, and collaborate on all kinds of analyses and confidently make decisions that improve business outcomes. For the IT Team, Pyramid eliminates IT bottlenecks and time wasters. Delivering self-service analytics in a centrally managed environment gets IT out of the report-building business. And it stops the spread of unsanctioned desktop tools which burden IT support and undermine data consistency and security.

The Pyramid Analytics Decision Intelligence Platform is ranked #1 in numerous categories by leading analysts including Gartner, Forrester, BARC, and Dresner Advisory Services. Pyramid Analytics has over 500 Enterprise customers with over 2,400 customers worldwide and over 1 million active users. Pyramid Analytics was founded in 2009 and has offices in global innovation and business centers including New York City (US HQ), London, Amsterdam, and Tel-Aviv. Pyramid Analytics is backed by leading venture capital companies including SEQUOIA, JVP and Viola Growth.

Pyramid Analytics is currently being used at other agencies, like the Department of Veterans Affairs (VA), and provides ETL, Data Prep, Data Modeling, Visual Analytics and Data Science capabilities to help VA Business Analysts meet the healthcare needs of veterans as well as provide valuable insight into staffing needs across all VA hospitals. The Pyramid Analytics Platform has grown significantly since the original deployment and now provides Business Intelligence capabilities for over 30,000 users across the VA. The current deployment allows for connection to new and existing data sources via ODBC, JDBC and cubes.

Flexible deployment options include on-premises, public, private and hybrid cloud, and multi-cloud. Pyramid’s Kubernetes solution works with Docker containers and can be deployed into any standard

Kubernetes cloud hosting service, including AWS, Azure, Google (GCP), Oracle Cloud Infrastructure, and RedHat OpenShift.

Difficult Problems Require Sophisticated Yet Intuitive Analytics.

With Pyramid, everyone is brought together in a shared, collaborative analytics environment. Experienced users can prepare and model data on their own to answer tough questions, data scientists can use machine learning algorithms to understand difficult business problems, and business users can conduct high-end analytics without IT assistance to allow truly collaborative interaction and understanding of data, supporting insight that drive key business decisions.

Our goal is to help our customers succeed by orchestrating enterprise-wide decision-making through transformational trusted analytics and avoid the pitfalls of single user desktop tools or, at the other extreme, over regulated IT analytics platforms. Pyramid Analytics provides a holistic approach to merging business analytics, data wrangling and data science for all business users.

Pyramid Enables Your Enterprise Data Strategy.

To be successful, executives and data leaders must align people, processes, and technology to create a universal analytics environment. This gives everyone the ability to access, explore, and understand traditional and Big Data sources, no matter where they are or what type of device they're using.

Active Viewers Active Viewers get structured, organized, and interactive reports and dashboards in Pyramid. Pyramid offers valuable features like interactive commentary, alerts, and AI-driven guided analysis for simplified report and dashboard generation.

Data Workers Proficient analysts can use or build interactive content across the entire platform, including calculations, data mash ups, presentations and publications which can then be shared across the organization by simply dragging and dropping content for immediate consumption across the entire user community, whether via browser or a mobile device.

Data Scientists In addition to information workers, Data Scientists can build complex scripts and models (R, Python), create advanced data models, and use advanced analytic functions to deliver sophisticated analytics easily and at speed to other users.

Casual or Embedded External Application Viewers Casual users get guided access to simplified and interactive reports and Dashboards with content selection features. Our embedded analytics integrates powerful BI capabilities directly within your custom applications and user portals. Deliver powerful, self-service analytics solutions that are easy to customize, integrate and deploy, getting your solution to market faster while you stay focused on your business skills with your customers and partners.

Peripheral Recipients (Non-Pyramid or Disconnected Users) Non-Pyramid or disconnected users can receive automated static content with dynamic natural language generation output in PDF, PowerPoint, Word, and other formats, driven through an auto-scheduling and auto-distribution capability to easily share regular reports without additional user intervention.

3. Data Processing System Architecture.

Pyramid's BI architecture was designed from the ground up to be platform-agnostic and scalable. Deploy it in any scenario, on-premises, in the cloud, or across a hybrid environment, and on any technology platform. Pyramid allows organizations to truly maximize the value of existing infrastructure and realize their enterprise.

Your technologies, your choice

Our OS-agnostic Java platform can be readily integrated into any environment, allowing you to build and implement an enterprise architecture that meets your business model and your data strategy. You choose what works best for you: on premise or private cloud. Run Pyramid across these and other platforms.



Microsoft Azure

ORACLE

Google

IBM

snowflake

Common analytics environment for all.

Technology leaders must balance access to content, data, and resources. Unfortunately, new sources of data and the proliferation of personal productivity BI tools have made it incredibly difficult for them to manage their enterprise BI ecosystems.

Pyramid empowers technology leaders to easily get a handle on their BI infrastructure in three ways:

- Users work together in a common analytics environment where content can be shared, managed, and secured.
- Robust administrative controls provide greater visibility into an organization's product usage.
- Managing existing users—and provisioning new ones—is simple and seamless.

Deploy anywhere.

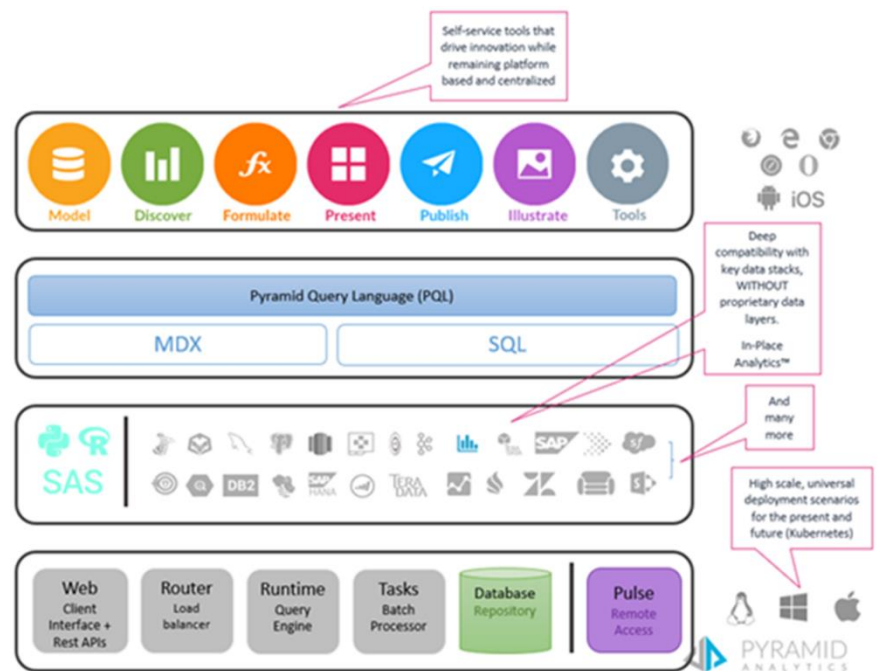
Pyramid is built to scale and be deployed in any environment: on premises, in the cloud, and across hybrid deployments. It features an open, flexible, multi-tiered product architecture that can be scaled out and up by tier. In addition, the Analytics OS can run on any Java-based platform (Windows, Mac, Linux) and features a scalable repository that uses optimized container images that can be deployed in any ANSI SQL-compliant setting.

Hybrid deployment: Access data across any environment.

Design your data architecture according to your needs, not the requirements or limitations of a BI vendor. Using Pyramid's Pulse Server, you can now query and model on remote data sets, regardless of location or domain—no VPN required. Don't pull your data to the model; model the data where the data lives.

The Pyramid Analytics Decision Intelligence Platform includes the following:

- **Universal HTML5 Client** - Single, modern interface with multiple modalities for self-service data processing, analytics, and



visualizations. Full client, Light client, Tablet & Mobile (JavaScript, React, TypeScript, D3)

- **Analytics and Semantic Engine** - Pyramid Query Language + semantic engine + formula engine + data modeling engine. Generates MDX or SQL queries. (Java)
- **Data Engine and Connectors** - Multiple data engine options (including internal in-memory, SAP Hana, Oracle, MS SSAS etc.). Ingestion of 'any' data sources via JDBC. Native support for R, Python & SAS language for ML, scripting & advanced analytics. Integration with Apache Presto and Drill (Java/jdbc, .Net, Rest, R, Python, SAS language, Apache)
- **Scale up and out Server(s)** - Multi-tiered server design that can be deployed anywhere, on-premise or cloud, in multiple OS's. Pulse Server for true, uncomplicated remote data access. (Java)

4. Open Science.

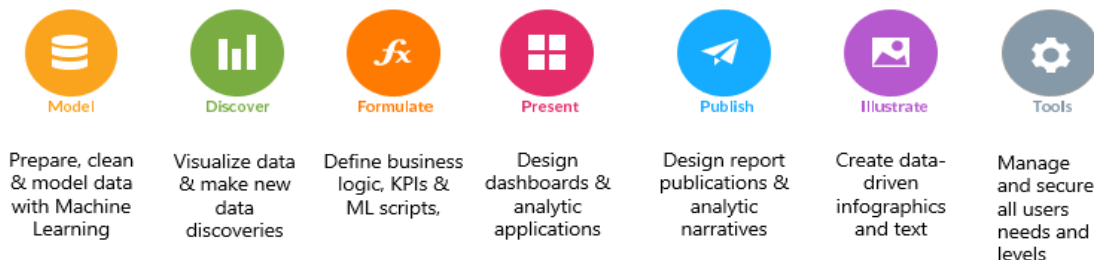
There are many capabilities wrapped up in the Pyramid Analytics Platform that will assist the mission science data processing system in achieving transparency in data, analytics, and knowledge. Within the platform this can come in the form of containerized server components with unrestricted access to internal and external data sources using Pulse, a shared semantic layer that allows for consistency and governance at the data exposure level which in turn promotes effective communication of the data and insights. All wrapped up in an open platform that does not set standards or rely on capturing intellectual property for personal growth. The Platform would be exposed to those the science and research community deem relevant to have access.

The Pyramid Platform prides itself on being a complete end to end data and analytics solution that by its very nature drives users of the data to be the most efficient consumers with reusability of content. Easy sharing of content with colleagues, a data cataloged for all connected sources brought into Pyramid for a complete view of available data assets that are derived once and reused by anyone who has access, an ML driven recommendation engine for exposing relevant content that colleagues may be working on, and a full distribution engine for the secure dissemination of analytical content.

5. Component Technologies.

One Platform, 7 Powerful Components

Pyramid features six distinct analytics modules —plus an Administrative Console and Content Management System—to deliver a complete analytics experience:



- **Model** - Model is the interface in Pyramid for users to prepare, condition, and structure data for analysis - effectively allowing them to create data mashups, data preparation routines and ultimately semantic data "models". Data models can be basic or highly complex with Pyramid providing all the data transformation components required to meet the user's needs.

- **Discover** - The discover module connects to the data model and enables users to create sophisticated visualizations of their data. This is where Pyramid's data science functionality shines by allowing the user to add a range of ML and predictive features, such as forecasting, clustering and outlier detection.
- **Formulate** - This is the area where users can build custom measures on top of their data. For instance, users may want to add two numbers together or calculate the ratio of complete vs incomplete audits.
- **Present** - Present is where users create their dashboards by dragging and dropping their graphs onto a canvas. Users have the option of static or scrollable pages with the ability for full customization on filters, colors, and visual elements.
- **Illustrate** - Our illustrate module allows users to add dynamic text into the dashboard. This gives developers the ability to create custom text insights, sharing a story on the insights within the data.
- **Publish** - Our Publish module allows you to publish dashboards to users, send out static copies via email, pdf or PowerPoint and schedule when you want this to happen on an automated basis.
- **Tools** - Our Tools and content sections provides the admin full control in terms of settings and governance. Here you can control who sees what, setup specific user groups and monitor resource and connected data sources.

6. Downstream Interoperability.

A robust mission science data processing system should be able to provide downstream consumers with a secure and governed way to consume data in whatever manner that consumer requires. To that end, the Pyramid Analytics platform first provides the semantic and data virtualization layer to ensure that the data provided is done so securely but also in a way tailored to the particular consumer. This Model layer allows the platform to present the same data in multiple ways without having to duplicate or modify source data in any way. In addition, consumers will want to consume via multiple channels. The Pyramid Analytics platform provide consumers with the widest array of consumption channels, including HTTP, via REST API, OData, or embedded via HTML div tag or JavaScript.

In addition to multiple channels, consumers should be able to consume also at the rate they want to. Pyramid Analytics can access data real time through its direct query capability. Because it also has ETL and data flow capability, data can also be read, prepared, wrangled, and then written to a target source on a scheduled and automatic basis. In addition, data can automatically be delivered to the online experience to provide a near live stream of data.

The Pyramid Analytics Decision Intelligence Platform also includes modules for distributing the data to the consumers in multiple ways via web-dashboards that can be available in a stand-alone web-site or embedded within existing NASA web-sites that are available for either internal or external consumption. The platform also includes a comprehensive publishing module that can deliver the desired information to the consumers via standard office tools like e-mail, Microsoft Word or PowerPoint or Adobe PDF documents that can be sent to the users immediately or on a scheduled basis. The publish module will allow wide distribution of the data for consumption by all interested parties both inside and outside of the agency including citizen scientists.