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Oracle Financial Services Model Management and Governance

The financial services industry continually faces the challenge of comprehending and reacting to exponentially growing volumes of data. The need to identify hidden data patterns–while leveraging governance capabilities like versioning–makes machine learning and predictive analytics mandatory capabilities. Oracle Financial Services Model Management and Governance addresses this by combining advanced model lifecycle management with the ability to address regulatory requirements and model governance.

MODELING ROADBLOCKS

Data

A model is only as good as the data it is provided. So, it is no surprise that data acquisition and preparation are key challenges that modelers face today. The need to ensure that data is accessible from internal and external data sources is compounded by the fact that this data must be available for reuse across models in a secure manner. In addition, the ability to handle extreme data volumes is key for rapid model development and improved modeler productivity.

Model Management

As data volumes inflate, the ability to fast track the identification of robust models while reducing mean time to production becomes critical. This requires adept use of modeling techniques, production data reuse, training models, iterative comparison, and fast provisioning/deployment combined with adequate manual intervention to identify and roll out champion models.

Continuous Improvement

To address the exponentially growing and constantly changing needs of a financial services organization, it is critical to have the ability to repurpose existing models and data sets. This directly impacts a customer's capability to build relevant models faster.

Ease of Use

There is a need for the modeling paradigm to go beyond the purview of data scientists to business analysts and technology teams. This can be facilitated with seeded tasks to support activities like data ingestion/profiling, feature engineering, model configuration/training/validation/ deployment, etc.

Governance

Today, regulatory compliance is more than a buzzword for financial institutions. So, model governance– covering key aspects of model lifecycle, like data, model development, implementation, comparison, validation etc.–is of paramount importance to financial services organizations.

Compatibility

The need for a collaborative workspace that supports multiple programming languages (e.g. R, Python, PySpark, etc.) is critical to address an organization's current and future needs. Not only does this improve compatibility but it also makes it easier for organizations to staff their modeling needs and significantly reduce retraining efforts.

The Oracle Financial Services Model Management and Governance toolkit provides a single solution to address the above challenges by enabling financial institutions to implement their IT policies while providing the flexibility and freedom that data scientists and statistical modelers desire. Today, financial institutions require models that seamlessly integrate traditional statistical techniques with modern machine learning methods. Oracle Financial

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Services Model Management and Governance addresses this by leveraging a notebook environment to develop, deploy, and manage such models at the enterprise level.

VERSATILE SANDBOX MANAGEMENT

Oracle Financial Services Model Management and Governance comes with a robust sandbox management capability to help customers iterate models with production datasets and filter the most relevant model for deployment. These capabilities are outlined below.

- Allow administrators to define and provision target agnostic sandboxes with customized subsets of production data and make the same available for modelers.

- Provide modelers complete freedom to build, test, and calibrate models using production data, while keeping the production environment locked down for security and compliance needs. Modelers can build models without any exposure to the physical data tables and columns in the database. In effect, the data is ready, and saves modelers the arduous task of accessing and querying the database.

- Facilitate promotion of validated and approved models from sandboxes to the enterprise model repository. Models in the repository can then be woven into analytical application flows crafted by mixing data management tasks, model execution, and deterministic business logic.

- Sandboxes can exist in the production environment or in a separate instance on their own with a copy of data that comes from the desired production or external data source.

## COMPREHENSIVE MODEL DEVELOPMENT

Oracle Financial Services Model Management and Governance extends Oracle's tried and tested Enterprise Model Management framework that was built specifically to meet the needs of large financial institutions with external regulatory and internal governance policies. It not only leverages popular statistical platforms such as R and Python but it also provides a framework for developing, deploying, and managing models at the enterprise level with the following features.

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FIG. 1 MODEL DEVELOPMENT
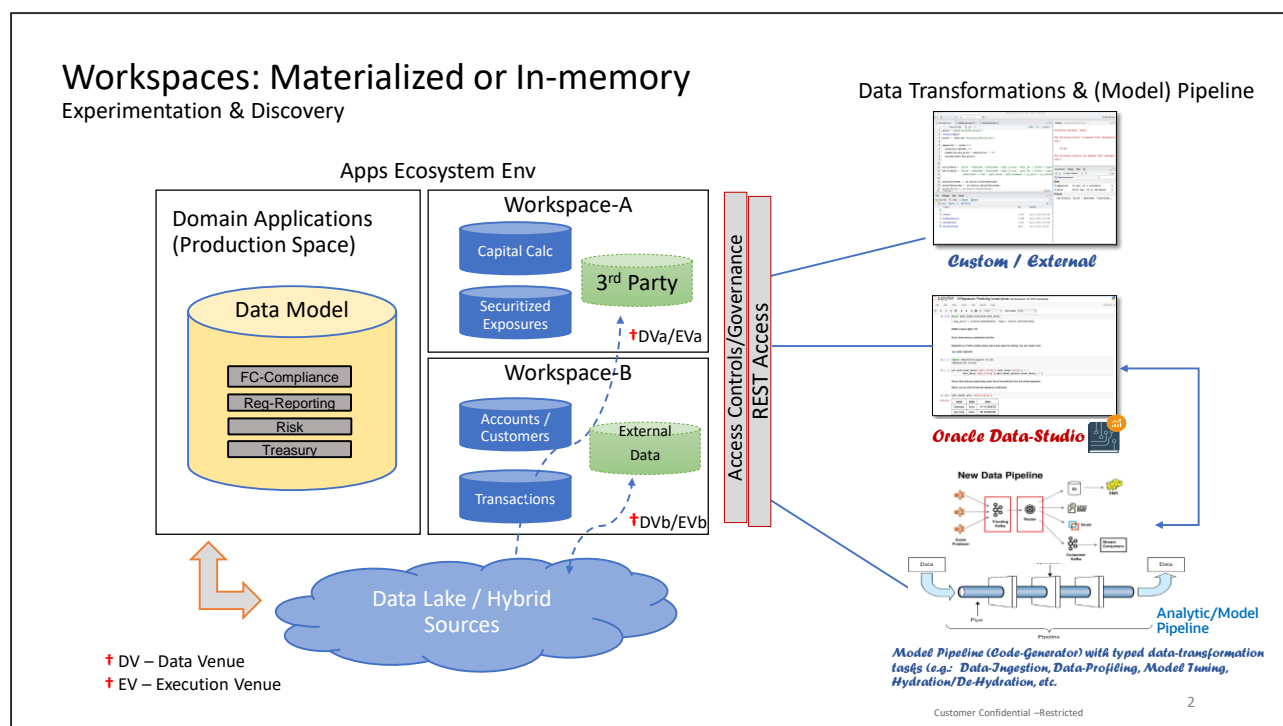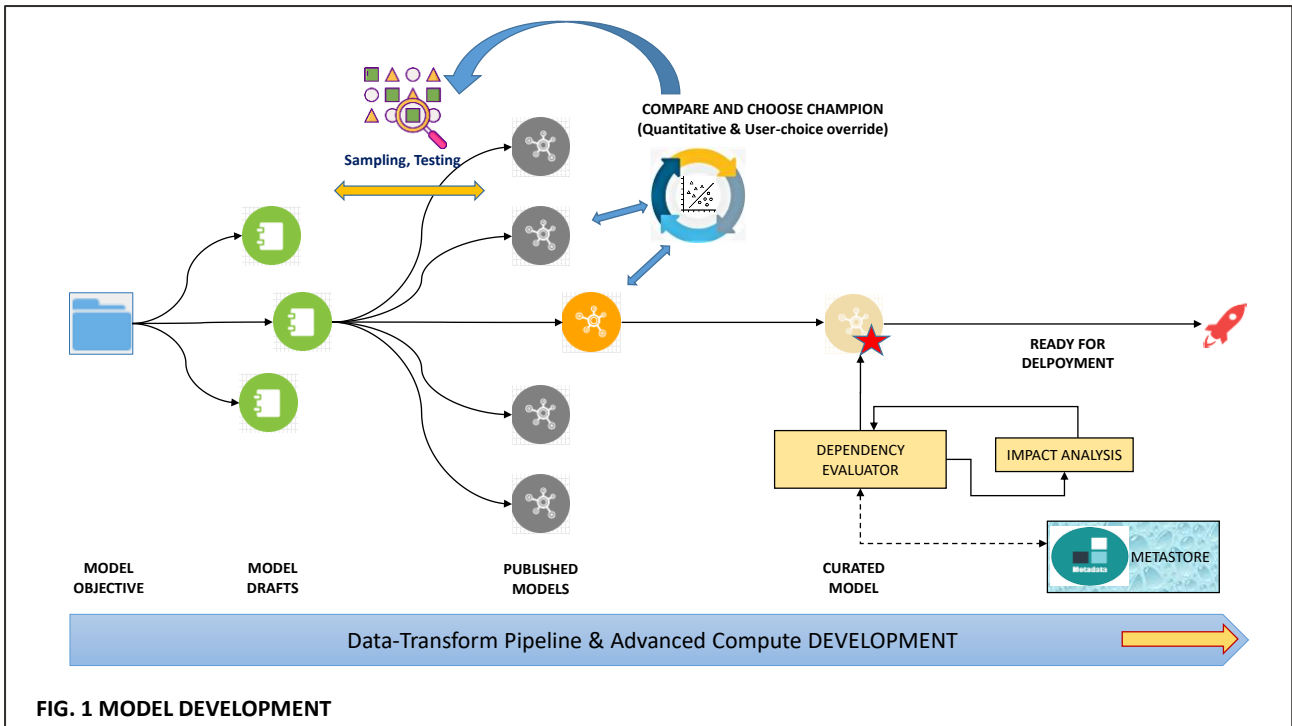
- Provides customers built-in Model Development Studio that supports polyglot model development constructs like "R," "Python," "PySpark" and "PGQL for Graph." OFS MMG also comes with a pre-built connectivity to OFSAA data sources for Enterprise Risk, Financial Crime/Compliance and external repositories within the customer ecosystem. Exploratory data analysis can be interactively done with SQL, PGQL, and Python-PANDAS libraries, etc.

- Has industry leading graph engine and runtime interpreters for a variety of open standards-compliant model encoding technologies.
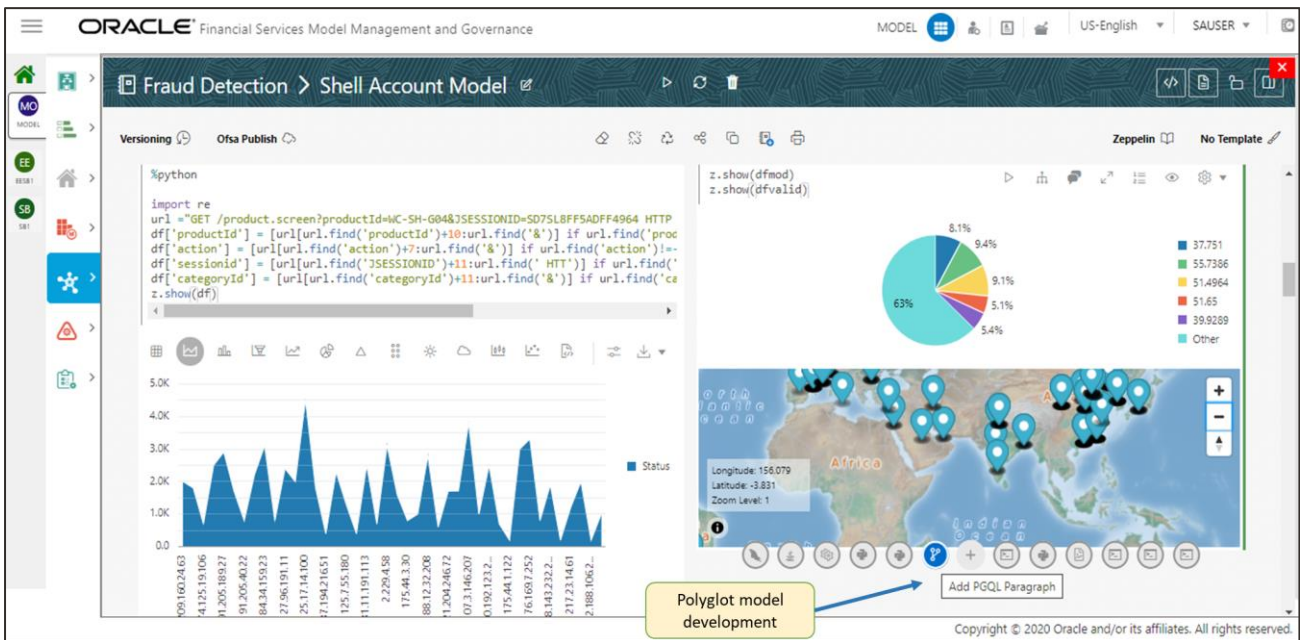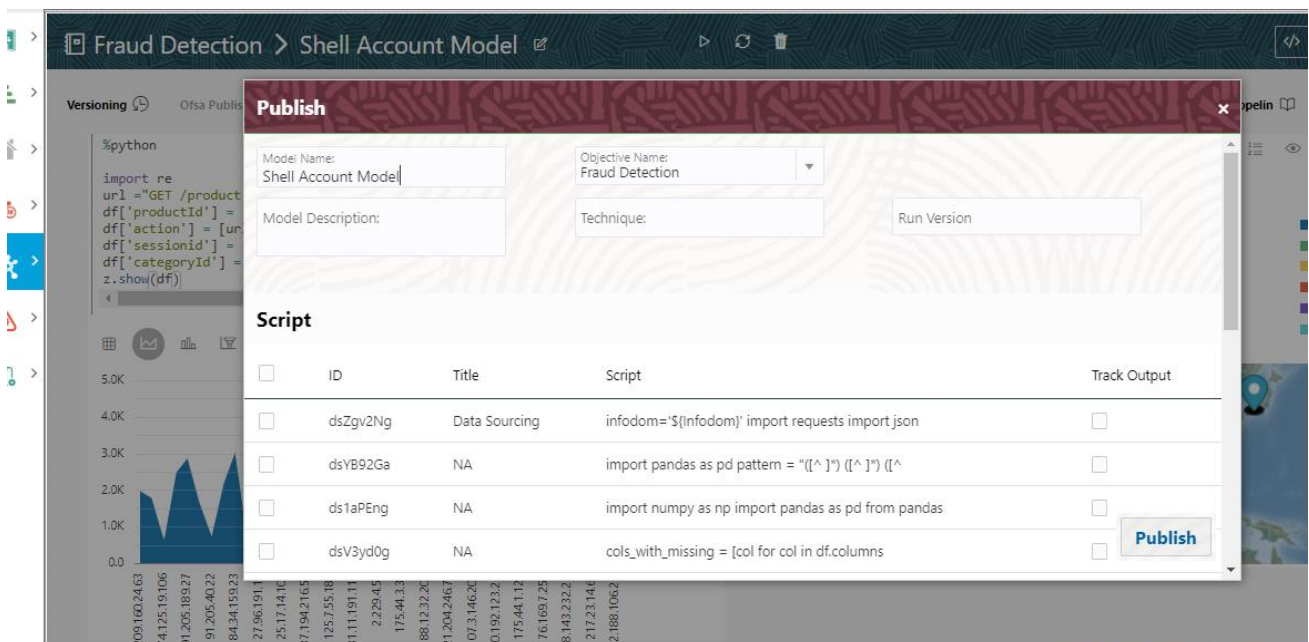
Interactive Model Development

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Selective Paragraph Publish

- Model Development Studio provides both deterministic rules-based and machine learning-based model development with full life-cycle, governance, audit and lineage. It supports interactive model development, training, scenario simulation, attribution, analysis (what-if, how-so, etc.) and provides a model pipeline that allows business users to configure the outline of a stochastic process model.

- Allows modelers to create models using notebooks in the Studio. The notebooks help build training models, and comparative iterations filter the most relevant models that can be considered for deployment in production. Modelers can then use their judgement to consolidate their choice and fix on one model, the champion/scoring model. Also, comes with advanced model management features like champion-challenger, model performance measurement and auto-lineage to help customers' fast track the best performing models.

- Provides customers a canvas to drag/drop and design or assemble an end-to-end process model that includes seeded 'OFSAA' task types and scripted models. This helps customers interactively work with both types of compute via the Data-Studio interface. Also, the Data-Studio scripted model can be transformed as a pipeline (process model) for better perception of dependencies, parallel paths, dynamic parameterization, etc.

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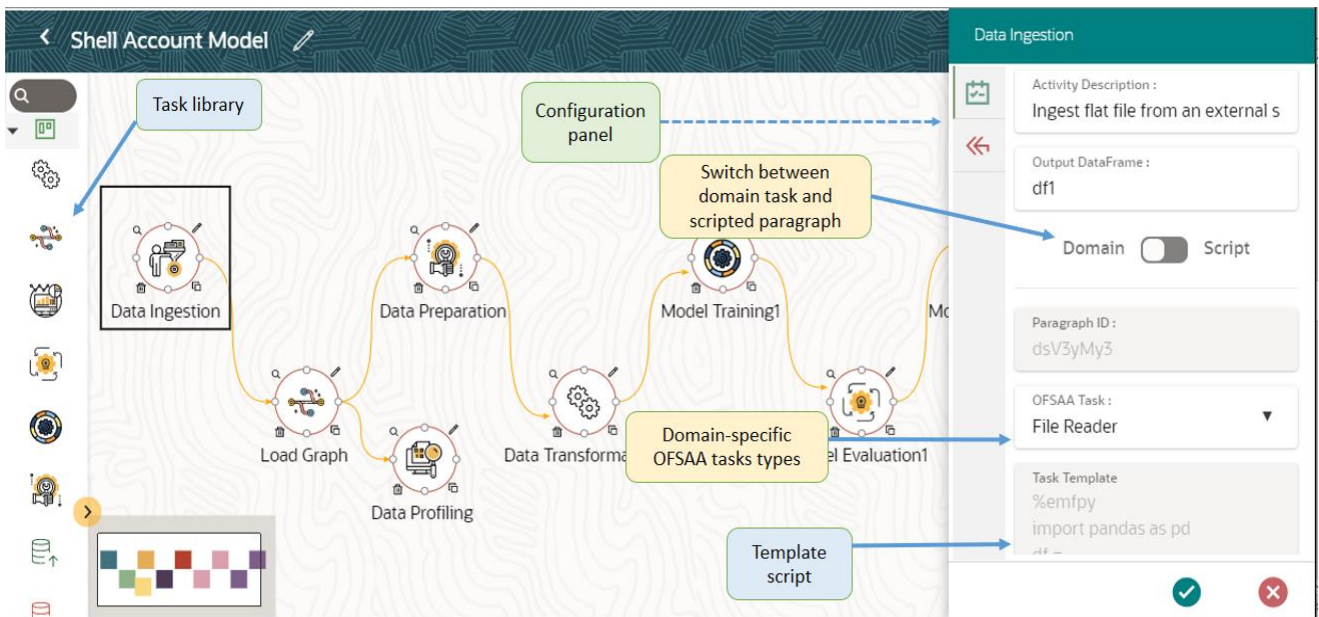
Pipeline Designer

- Provides a unified platform with statistical modeling, data management and application deployment so that customers can quickly deploy models for use within analytical applications. OFS MMG also includes an inbuilt workflow to deploy built models to locked down production.

- Allows customers significant flexibility by enabling models as 'drafts' that can be reused/re-purposed while 'Publish' functionality allows picking of relevant paragraphs and combining them to form a 'model.'

- Model pipeline facilitates citizen-modeler to configure models using a canvas. This provides seeded task-types (Data-Ingestion, Data-Profiling, Data-Transformation, Model Tuning, Model Training, Data Hydration/De-Hydration, etc.) that automatically generate model-script or outline with auto-generation of forms to capture user-input for place-holder parameters. This allows for inline editing of pipeline tasks to augment generated outline/scripts. In addition:
  - o Data source access and transformation types/model-tasks are driven by security/user entitlements
  - o Solve order can be declaratively specified
  - o Notebook is generated behind the scenes

- Provides comprehensive workflow capabilities for model management like process model review, local vs. global deployment, re-instate as champion, retire models, etc. Deployment automatically takes care of dependencies packaging and supports both online & offline publish to target runtime or production environment.

INTEGRATED MODEL GOVERNANCE

Data lineage and traceability are central to a financial institution's governance process. Oracle Financial Services Modeling Management and Governance provides a toolkit for developing complete end-to-end analytical applications with visual data lineage and traceability enabled at every step along the analytical workflow. The Model Governance impacts how the application functions with various user types and determines the requests they can place from the model details window. Oracle Financial Services Model Management and Governance

- Comes fully integrated with the Oracle Financial Services Analytical Applications Infrastructure (AAI). This allows models promoted from Oracle Financial Services Model Management and Governance application to be available as tasks in Oracle Financial Services Analytical Applications Infrastructure and can be included in any orchestrated execution of tasks.

- Comprises model versioning to ensure effective dating, tagging, grouping by objective/sub-objective with access control on data accessed by models.

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- Offers the ability to secure and check runaway execution or data-access or ingestion of spurious data with visual audit trail and timeline view.
- Provides real-time view of dependencies such as which applications use which models, which variables are used in a model, etc. This helps customers perform what-if impact analysis for changes to data sets, variables, and models. Also, these dependencies are automatically handled during publish, migration or export.

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