MathWorks®
Accelerating the pace of engineering and science

Facilitating Model Governance with the MathWorks Model Inventory

Having an inventory of models is necessary, but not sufficient, for good model governance. The MathWorks Model Inventory enables model risk managers to capture the relationships between models, usages; and data; maintain the hierarchy of models; manage the model lifecycle; document models; automate workflows; and provide management reporting and oversight.

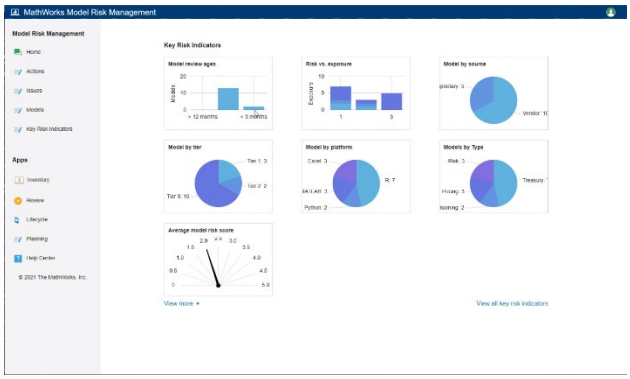
Introduction

The Federal Reserve's ***SR11-7***, The Bank of England's ***SS3/18*** and the ECB's ***TRIM guide*** are all explicit in their need for robust model oversight in regulated financial institutions.

The MathWorks Model Inventory environment goes further by:

- Capturing all models and (user-defined) metadata
- Codifying and graphing the relationships between models and data
- Administering the hierarchy of models
- Managing the model lifecycle through development, validation, and deployment
- Providing rich management reporting
- Cataloging business overrides, overlays or business-line guardrails

The environment supports models coded in MATLAB®, Python®, R, C++, C#, Java®, and SAS®.

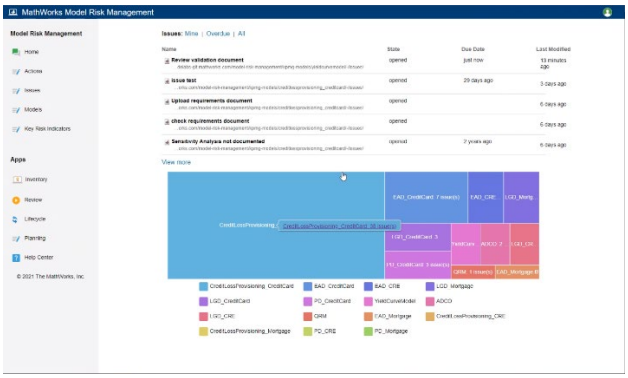


Model status dashboard.

Model Landscape and Metadata

The MathWorks Model Inventory supports highly configurable model metadata and enterprise-defined workflows including:

- Unique identifier and version
- Business/product line owner
- Permitted uses
- Materiality assessment/risk rating
- Links to model code, executable, and documentation
- Specific regulatory applicability (links to the actual regulatory documents)
- Links to sensitivity and stress test reports
- Model dependencies
- Data sources, dependencies, and libraries

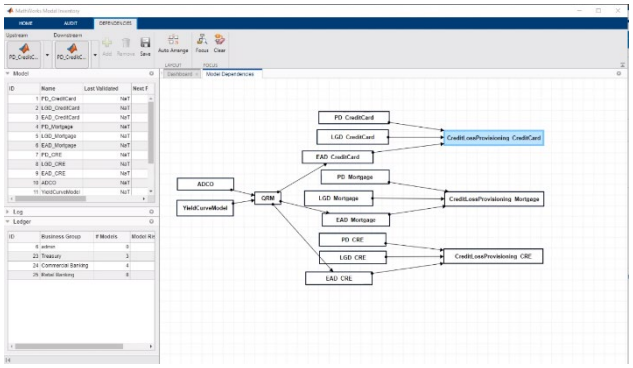


Model overview.

Facilitating Good Model Governance

The environment helps organizations fulfill their model governance obligations and responsibilities to both regulators and other stakeholders, throughout the model lifecycle by providing:

- Deep, granular reporting for model governance forums and oversight committees
- Validation: stage, findings, exceptions
- Completed self-certification documentation
- Full history/audit of each "touch"
- Checklists and questionnaires
- State of ethics, bias, and fairness audits
- Dynamic model health alerts: overdue tasks, data set changes, overwrite volumes
- Model and data lineage



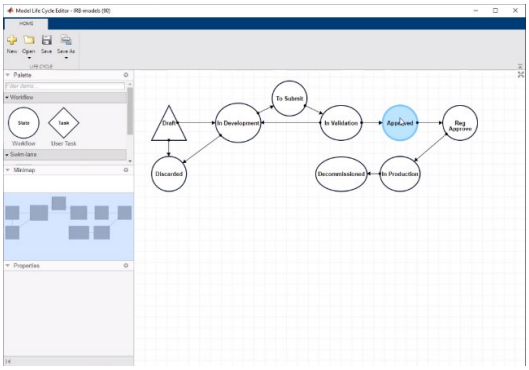
Model/data dependency relationship view.

MathWorks®
Accelerating the pace of engineering and science

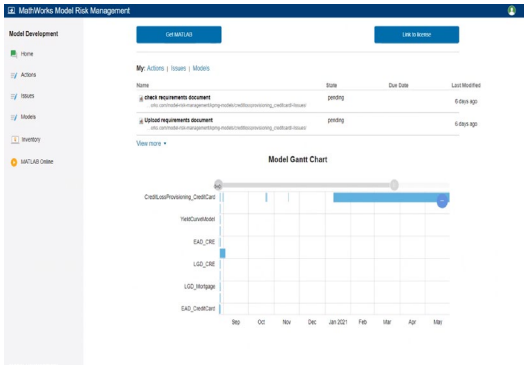
Model Workflow and Resource Management

To enable collaboration across teams. The model lifecycle view provides full transparency of model states and ownership and supports advanced workflow functionality such as:

- Status of fairness and bias gates
- Candidate models
- Action alerts and triggers (periodic review, grandfathering)
- Workflow dashboards and Gantt charts



Model workflow process.

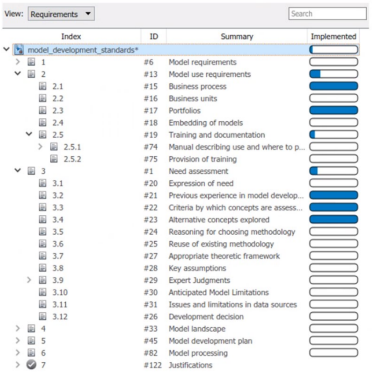


Gantt chart view, which provides visibility on the model pipeline and facilitates efficient resourcing.

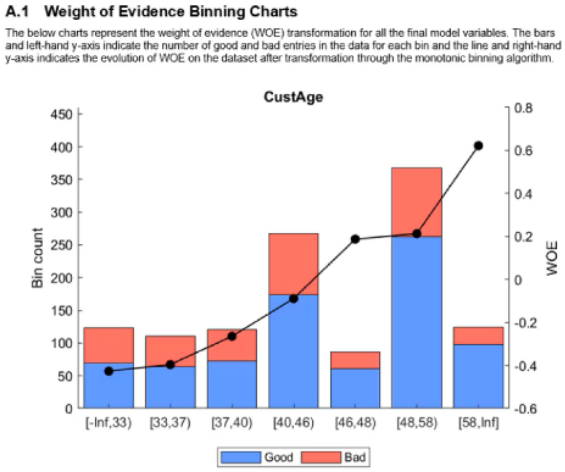
Model Documentation Management

The environment enables you to:

- Manage large, structured documents
- Import existing standards and regulations
- Update documentation with current analysis
- Link to upstream requirements and regulations
- Dashboard, reporting, and analysis for compliance



Tracking progress of model development and validation against standards.



Documents automatically updated with latest results.

Enterprise Integration as Standard

The MathWorks Model Inventory environment enables you to encode user-defined fields, relationships, and workflows in an open architecture that works seamlessly with common enterprise applications.

One team might build their models in Python and use Jira for task management, GitLab® for source code control, Microsoft® SharePoint® for documentation, and Tableau® for reporting, while another might use R, Microsoft Planner®, SVN, Confluence, and Power BI®. A model risk management function that tries to impose standardization on the rest of the organization *at the outset* will likely meet considerable institutional resistance.

The model risk function needs to view both the regulators and managers to whom they are responsible and the business lines, validators, and developers whose models they must risk-manage as partners in the model inventory processes, not as adversaries. The right technology solutions can facilitate this partnership.

» Learn more about model risk management solutions