

MADe Annotations

Document, monitor and assess the quality of analysis across the asset life-cycle.

Key benefits

- ▶ Improve quality of analysis outputs
- ▶ Reduce GIGO!
- ▶ Provide traceability on analysis using data sources

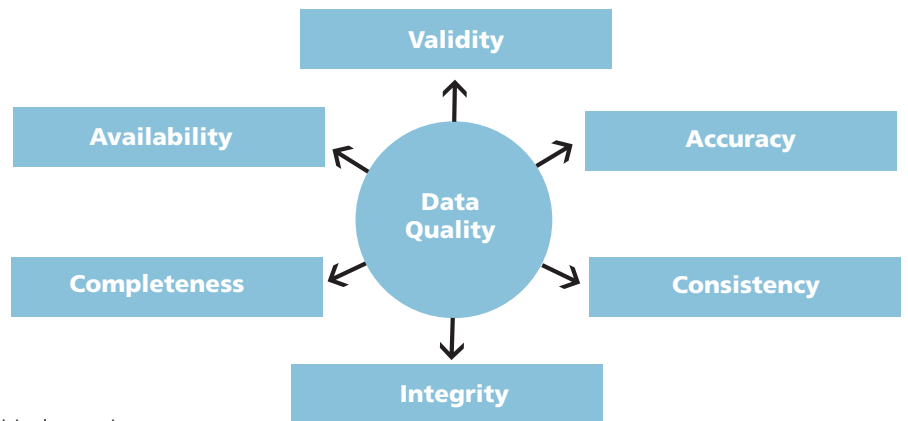
Key features

- ▶ Capture data sources and key assumptions
- ▶ Risk mitigation for data quality, integrity and currency
- ▶ Annotation process in MADe is configurable to meet specific workflows of your organisation

Problem: When it comes to model based engineering: Garbage In = Garbage Out. The quality of the assumptions, data and parameters used in a model directly affects the integrity of any analysis output. However, it is difficult to keep track of the data sources and assumptions that support any parameter used in a model, particularly if multiple stakeholders are involved in system development.

Solution: A structured approach to document and reference data for model based analysis is essential if quality is to be maintained across an engineering process. The annotations capability within MADe allows sources of data to be attributed to item parameters based upon the live and current state of the system model.

How can you improve the quality of analysis data across the asset life-cycle?



Data quality key performance indicators.

What does MADe Annotations do?

MADe Annotations provides a means to answer critical questions regarding model data such as:

- ▶ Where does a particular parameter or data set come from?
- ▶ Who sourced this data?
- ▶ Why was it set to this particular value?

What does MADe Annotations output?

Once this information is captured, MADe Annotations generates reporting outputs that include:

- ▶ A summary of the overall asset model confidence based on the quality and quantity of data annotated
- ▶ An overview of the annotations in terms of type, status and sources
- ▶ A list of all active annotations in the model including pending annotation tasks

What benefits does MADe Annotations provide?

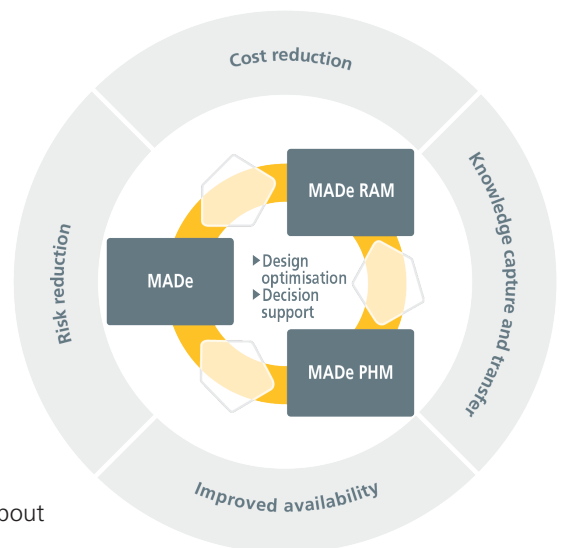
Optimise the confidence level in analysis outputs from a MADe model by:

- ▶ Documenting and reviewing all parameters used in the model / analysis
- ▶ Mitigating posting cycle issues as expert knowledge to a project file is retained
- ▶ Ensuring that all relevant supporting assumptions are captured
- ▶ Providing traceability to the modeling process

So what?

MADe is a model based integrated toolset that enables better informed decisions about design and supportability.

MADe Annotations ensures that the engineering function can assess the quality of the models and therefore the reliability of the analysis outputs using validation and verification processes that are displayed using Dashboard Indicators of Model Quality and Data Quality, and Confidence Level.



How does MADE Annotations improve the quality of data / analysis?

MADE Annotations associates each parameter used in the model with a pending annotation – i.e. information about a decision or value – that is required to be entered by the user. This process provides auditability of all information.

Dashboard

- ▶ Generates an overall confidence level in the model based on data source quality and coverage of annotated data.
- ▶ Generates an overview chart of the data sources used in the model.
- ▶ Compares confidence assessments using alternate data sources.
- ▶ Provides each data source with a confidence rating based on inherent source reliability.



Annotations Editor - Model Parameters

- ▶ Lists all the model parameters created/edited by the user.
- ▶ Defines various details for each parameter – data source, person who sourced the data and status of the annotation (pending or annotated).

Assign a data source to parameters

Status	Date	U...	Type	Severity	Item	Event	Source	Comments
PENDING	2016/07/25	P...	Added	Important	APC Platform	New Item (Modules) added to APC Platform		
ANNOTATED	2016/07/25	P...	Added	Important	APC Platform	New Item (Item A) added to APC Platform	Peer Reviewed...	Configuration change
ANNOTATED	2016/07/22	P...	Edited	Important	Refine Gas Con...	Compensating Provisions changed from [None] to [Condition-based Maintenance]	OEM	from the maintenance manual
ANNOTATED	2016/07/22	P...	Edited	Important	Refine Gas Mas...	Compensating Provisions changed from [None] to [Modify Mission]	OEM	From the maintenance manual
ANNOTATED	2016/07/22	P...	Edited	Important	Outgrowths (Al...	Failure Conditions changed from [None] to [Loss of output]	Operating Data	Observation of operating failures

- ▶ Sorts and prioritizes annotations tasks using filter options.

Filter Options

Status: Pending Annotated Unchanged

Date range: All From: 8/1/2016 To: 8/1/2016

Severity: Required Important Optional

Item/Event Description: Search...

Maximum records: 500

Annotations Editor – Narratives, Assumptions and Comments

- ▶ Lists all the narratives, assumptions and comments created/ modified by the user.
- ▶ Defines various details for each piece of information– date, user, item, type, narrative and status of the annotation.
- ▶ Sorts information based on the editor or analysis that is annotated.

Type: System Model Failure Diagram Item RAM Mission Profile Mission Phase Mission Segment Sensors Test Point Sensor Function Flow Flow Property Maintenance Cost Estimate

Item/Narrative: Search...

Date	U...	Item	Type	Narrative
2016/08/02 15:06:00	P...	Mission Profile Group FY2015	Mission Profile	The mission profile group assumes operation within the design specified limits of...
2016/08/02 15:06:10	P...	Peacekeeping Mission 1	Mission Profile	Military standard mission profile as described in the...
2016/08/02 15:06:16	P...	Peacekeeping Mission 2	Mission Profile	Military standard mission profile as described in the...

Annotations Policies

- ▶ Set/edit Annotation policies to define the annotation requirements for parameters in a model.
- ▶ Policy settings automatically impact the overall confidence in the model.
- ▶ Define pessimistic, agnostic or optimistic confidence level of sources and importance (severity) of crucial and standard variables in the system.

Current	Policy name	Crucial severity	Standard severity	Confidence
<input type="checkbox"/>	MADE Minimal	Important	Optional	Optimistic
<input checked="" type="checkbox"/>	MADE Hybrid	Required	Important	Agnostic
<input type="checkbox"/>	MADE Strict	Required	Required	Pessimistic
<input type="checkbox"/>	User Annotation Policy A	Required	Important	Optimistic

Annotations Tasks Reminder

- ▶ Automatically reminds the user to edit pending annotations – i.e. provide data sources and relevant information to the modified items/data.
- ▶ Sets/modifies the frequency of task reminders.

