



VENDOR MODEL DOCUMENTATION STANDARD

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BACKGROUND:

The purpose of the MRMIA model documentation standard.

For model risk management purposes, a model validation is the set of processes and activities intended to verify that models are well designed, performing as expected, and used in line with stated business objectives. A validation requires independence from model development and use. The model documentation, therefore, should wholly describe and communicate the developer's intention and resulting outcomes with respect to the model development, i.e., the purpose, methodology, data, testing, assumptions, and performance - essentially what the model is, and what it is not. If documentation is incomplete, unclear, or less than compelling, a good validator has a responsibility to cite an issue - which suggests a higher level of risk. To alleviate this problem, *a vendor model documentation standard has been developed by industry validators, reviewed by mid and large size MRM bankers, and approved as standard by MRMIA.*

Historically, the requirements and expectations for documentation have varied from institution to institution, as neither regulatory guidance nor convergence of practice had existed. While this may be less problematic for internally developed models, it can present a challenge, or even a dilemma, for externally developed vendor models. As one can imagine, as validators from each client institution attempt to secure information from a vendor in slightly different means (different questions), it has been time consuming and frustrating for all parties involved. The vendor must consider how to meaningfully respond to each client in a manner that is complete, within an acceptable cost structure, while still being protective of any intellectual property. Ad hoc documentation and/or protracted access to a developer can be cost prohibitive. With the setting of this new standard, a vendor may clearly understand the expectations of the validator, minimizing the need for back-and-forth discussions between vendor developer and validator. For the vendor, this standard is expected to better enable planning, pricing, and client support.

Validators must follow the requirements set forth in SR -11 7. They should secure all relevant evidence from the model owner - including model development, data, implementation, governance, and performance monitoring. For vendor models, the validators cannot compromise their requirements due to vendor cost structures, availability of developers, or other limiting factors. They must conduct the validation, cite any deficiency issues, and provide recommendations. However, due to the mismatch between interests and constraints, vendor documentation can be difficult to secure or incomplete, resulting in validation issues. Resolution becomes a time-consuming consequence for all involved. For the validator, this standard is expected to lead to more complete, coherent, and meaningful evidences.

The standardized set of vendor questions should be considered a minimum standard. It does not include nuanced modeling questions, nor questions related to the model owner or users. It does not include questions related to internal data availability, treatment, and or controls. Internal model owner governance questions are also not included. The listed questions are for the vendors specifically.



STANDARDIZED VENDOR QUESTIONS:

A uniform set of vendor specific questions that include model development, data, performance, and implementation.

The standard questions are designed for most types of models. Not all questions may be relevant for the model in question, however, an explanation as to lack of relevance will be useful. The questions intentionally do not specify how the vendor should provide a response, but it should be complete. It could be a sentence, a paragraph, or even a whitepaper. Iterations may change over time, as validators provide feedback. Additionally, some questions may require analytical evidence. The vendor is expected to provide that evidence as they see most appropriate and complete. The developers should always make their interpretations and understanding clear and logical, so as to reduce the potential for follow-up questions and interviews. Redundancy or extraneous information is to be avoided if possible.

USE OF THE DOCUMENTATION STANDARD SERVES THE MULTIPLE PURPOSES, AS FOLLOWS:

- 1.) **MODEL VALIDATORS** – defined set of questions, that cover the model risks associated with the vendor and the developer, are consistently presented and addressed. This promotes more efficient and consistent validations and allows for feedback to developers and owners. Validators will set this expectation with the vendor early in the lifecycle of the model.
- 2.) **VENDOR DEVELOPERS** – a standard should enable the vendor to better organize and plan. Vendors may refer to their documentation as “adhering to the MRMIA Standard”, as opposed to addressing all questions from all banks. This defines their documentation scope in which they may create and maintain evidence. It reduces the related questions that would otherwise come from multiple validation groups. Over time, as feedback is provided by individual validators, the documentation may be enhanced. The vendor’s ability to prioritize any gaps, would be identified more easily.
- 3.) **VENDOR MANAGEMENT** – a common contractual shortfall between client banks and model vendors has been the lack of specificity related to evidence required by MRM. Historically, it tended to be at the time of validation when it is determined that model information is either absent or incomplete. The lack of specificity created issues.

[Model Name] - ABA/MRMIA Model Documentation Standard

Type	Description	Please provide commentary and narrative for each item below	Please provide supporting analytics and interpretations for each item below
Model Development	1. What is the intended business purpose of this model? Is there a specific regulatory or agency objective this model is to converge/meet with? i.e. CECL, Fair Lending, identify fraud, suspicious behavior, open checking accounts, pricing, estimate reserves, project credit losses, or capital stress testing, etc.	X	
	2. What estimation methodology is used, such as regression, cash flow analysis, algorithm, rules based, or other statistical approach. How was this methodology determined?	X	
	3. What is the final model structure ? This should include the equation(s), variables used, variable selection process, and the data source(s).	X	
	4. For non-statistical model - (i.e. ALM, Cash Flow, Roll rate, operational, or other) What are the iterative steps, and/or process flow, in which the estimation is derived. Provide detailed explanation on each equation used for the final calculation (e.g., cash flow calculations).	X	
	5. Are there standard settings for this model? Can these settings be changed, which ones, and under what conditions can this justifiably occur?	X	
	6. What key assumptions are used in the model? This may include generalized or theoretical reasoning. For example, an input may be assumed to be flat over the next 12 months, or credit quality is assumed to improve by some amount. What supporting analytical, or statistical evidence, is available to support each assumption?	X	X
	7. Is there any segmentation in the model? How was this justified and determined?	X	X
	8. How well does the final model(s) perform ? What fit, diagnostics, back testing, benchmarks, or other testing has been conducted to best ensure the reliability of the model estimates?	X	X
	9. What challenger or benchmark models are used to assess the efficacy of the current model? What is the comparative performance of that challenger/benchmark model?	X	X
	10. What is the change management process for model development? What controls (including SOCs), approvals, periodicity, and/or triggers are in place? Under what conditions is the model considered for re-development?	X	
	11. What are the known model limitations or weaknesses and their impact on model performance? If warranted, what plans and/or timelines exist to mitigate? This may include items such as validation issues, use in a stress scenario, judgmental assumptions, or other.	X	
	12. What sensitivity testing is conducted on the model? This may include when incremental shocks to either/both the key assumptions and variables. What are the results and interpretations?	X	X
	13. What designated resource is allocated to this model? What is their background and experience related to model development? How has this changed in the most recent 3 years?	X	
	14. Are there any current patents registered for this model? Are there any published whitepapers or academic journals that the methodology has been peer reviewed ? Has the model been validated by a 3rd party for conceptual soundness? If so, by whom, and please provide the validation report.	X	
Data	15. Please provide a data dictionary with clear descriptions of each variable element used to develop the model, and also necessary to implement(or run) the model.	X	
	16. What are the data sources for each of the data elements. What verification process was used to ensure their completeness and accuracy? Which data elements have a formal data certification process?	X	
	17. Please provide descriptive statistics on the data elements. What additional diagnostics are available to determine data applicability ?	X	
	18. What time period is used from the development data set? Is any proxy or consortium data used? If so, please explain the proxy rationale and/or representing participants? What are the results and interpretations?	X	
	19. What data monitoring process exists to compare data changes over time? i.e population stability.	X	
	20. What data treatment or transformations was conducted on each of the data elements? This should also include missing, outlier, pandemic era exclusions, or aberrant data, as well as how data fields are created by transforming values into rates or indices, etc.	X	
Implementation	21. Please provide a "step by step" document, or checklist, that explains how to implement the model (this should not be a model user guide). What recommended UAT testing should be conducted to ensure proper installation? What are the expected outcomes/thresholds for	X	
	22. Please provide a document that describes how to test and implement a new version release , such that model improvement is observable and evidenced, and proper implementation has occurred. This may include run times, fits, or other assurances.	X	X
Model Performance Monitoring	23. What testing and/or diagnostics are conducted on a regular basis to determine the level of model degradation that has/has not occurred since the model was developed – using the vendor's data. The measures may include stability, goodness of fit, back testing, and/or other measures.	X	X
	24. Please provide a document that details how the model owner should conduct ongoing performance monitoring , using client data. This should also include how to compare results to the model developer's performance monitoring.	X	
	25. Please provide a document that describes the end user tuning process (if applicable). What tests should be conducted to assess the need for tuning, the steps necessary, and the how to achieved a desired result.	X	

