The banner features a central image of a classical building facade with two large arched windows. On the left, a yellow-bordered box contains the text '2017 SOA Valuation Actuary Symposium'. On the right, a black box with yellow text contains the dates and location: 'Aug. 28-29, 2017 San Antonio, TX'.

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Aug. 28-29, 2017
San Antonio, TX

Session 63PD: Modeling Function: To Centralize or Not To Centralize?

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Session 63

Modelling Function: To Centralize or Not To Centralize *August 29, 2017*

Michael Porcelli, F.S.A., M.A.A.A.

Roles and Responsibilities for Firms with Models

- In this presentation, we will take a look at SR 11-7, the roles it describes and how this would lend itself to functions being either centralized or decentralized.
- While most insurers are not subject to SR 11-7, there are many ideas in it that are being incorporated in the life insurance sector's evolving model risk management framework.
- When we are done, we seek to identify the individuals who touch models and determine if following best practices would suggest they sit in a centralized area or not.

SR 11-7

- In April 2011, the Federal Reserve issued SR 11-7 – Supervisory Guidance on Model Risk Management
- It was an outgrowth of the Financial Crisis and the recognition that models play a key part in decision making at Financial Institutions
- While it was intended to apply to banks – and is written as such – some insurers have come under Federal Reserve Supervision and are thus subject to SR 11-7
- Some insurers have adopted portions of SR 11-7 in their formal, board approved Model Risk Management Policy, even if they do not fall under Fed supervision.

SR 11-7

What is Covered?

- Model Risk Management Overview
- Model Development, Implementation and Use
- Model Validation
- Governance, Policies and Controls

What is Not Covered?

- The 3 Lines of Defense Model – more on this shortly
- The Insurance Industry

SR 11-7 Introduction

- Financial Institutions rely heavily on quantitative analysis and models in most aspects of financial decision making.
- A movement in the direction of more disciplined model risk management has been driven by a combination of regulatory, management and shareholder pressures.
- Financial Institutions have been increasing the use of data-driven, quantitative decision-making tools for a number of years.
- The expanded use of models reflects the extent to which models can improve business decisions, but models also come with costs.
 - There is the direct cost of devoting resources to develop and implement models properly.
 - There are also the potential indirect costs of relying on models, such as the possible adverse consequences (including financial loss) of decisions based on models that are incorrect or misused.
 - Those consequences should be addressed by active management of model risk.

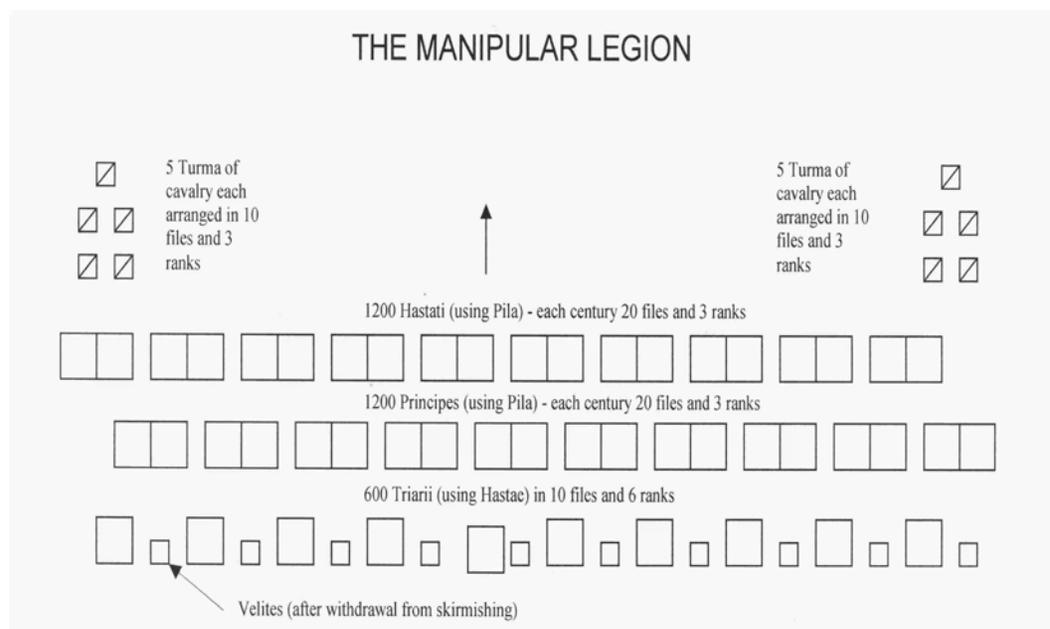
Lines of Defense in Model Risk Management

- We will talk about what these lines of defense are in relation to models, what roles fall within what line of defense and then try to draw some conclusions on best practices for each role
- We will look at the roles of Model Developer, Model Owner and Model Validator and determine where they fit into the 3 lines of defense structure
- From there, we can determine if their function is best centralized or not.

The 3 Lines of Defense Model

Then – Roman Republic, 3rd Century B.C.

1st Line	Hastati
2nd Line	Principes
3rd Line	Triarii



The 3 Lines of Defense Model

And Now – Post Financial Crisis of 2008



What we will be discussing in my remaining time is leading industry practices from the marketplace and how they drive functions naturally into being centralized or decentralized in a 3 lines of defense framework.

1st Line – Business Units

- Have ultimate responsibility for the performance of the business
- Choose what data and models are best suited for running their business
- Have leadership that have a vested interest in the reliable performance of the models
- Report to senior leadership on business performance and rely on models to assist in that task
- Generally speaking, business units are not centralized to allow for business unit heads to have ownership of the performance and accountability for the results

2nd Line – Risk Function

- The Risk function is organized differently in different organization
- One way is to include Operational Risk Management and a Model Risk Management department under a group level Chief Risk Officer
- Business Units may also have CROs that report to the group CRO but are embedded in the business unit
- Responsibilities include owning and maintaining:
 - The Model Risk Management Policy
 - The Model Inventory List – including a record of key roles associated with each model
 - The Model Validation Schedule
- Staff includes a dedicated team of professional model validators with prior experience of model building and model ownership
- Where staff capacity or proper specific subject matter expertise does not exist, independent validators from either inside or outside of the firm should be used.

3rd Line – Internal Audit

- Has a role to play as they make sure that policies are being followed. In other words, they “audit to the policy”
- Have been “deputized” by the Federal Reserve to ensure the first two lines of defense are functioning properly
- Increasingly, actuaries are finding their way into Internal Audit

Roles and Responsibilities

Model Developer



Model Owner



Model Validator



Model Developer - defined

- Responsible for turning Model Owner specifications into a functioning model for use in the business
- Can also be the Model Owner for a given model but not necessarily
- Can be a 3rd party firm such as an actuarial software provider
- A centralized area can exist that just builds some or all models
- Builds models to the specification of the Business and/or Model Owner but may not necessarily have ongoing responsibilities related to the model
- May or may not produce documentation as this is ultimately something that should be owned by the Model Owner

Model Owner - defined

- Ultimate responsibility for the performance, integrity, and reliability of a model.
- Responsible for using proper model inputs and methods to generate model outputs that are used within the business and shared with management.
- Creates and maintains proper model documentation
- Makes necessary adjustments in a properly governed change management environment
- Addresses model validation findings and can take necessary remediation actions as seen fit

Model Validator - defined

- A second line of defense function that sits in Risk
- Performs regularly scheduled model validation activities or, in the case of new models (ideally), performs these activities before a model goes into a production environment.
- Issues a validation report with an executive summary including findings
- Identifies remediation items
- A Model Validator who insists on specific changes to a model has stepped into the shoes of a Model Developer and this is something he/she should avoid doing

Gray Areas

- A model sits at a Corporate Level and is fed by business units?
 - Economic Capital model
 - Tax model
 - Treasury/Liquidity model
- It sits in Risk – function that is 2nd line of defense in nature?
- Specific model risk management policy wording and/or a waiver process may be used to handle unusual situations

Specific Model Risk Management policy wording and/or a waiver process may be used to handle unusual situations

In Summary

	Line of Defense	Centralized	Not Centralized
Model Inventory List	2 nd	X	
Model Development	1 st	X	X
Model Ownership	1 st		X*
Model Validator	2 nd	X	
Internal Audit	3 rd	X	

* Certain exceptions can apply

Decentralized models

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August 29, 2017

Josh Chee, FSA

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Agenda

- 1 Overview**
- 2 Benefits**
- 3 Challenges**
- 4 Potential solutions**

Overview

Actuarial modeling requirements continue to increase and become more complex



Many companies either find it difficult to centralize the model development function, or choose not to

Benefits

Decentralized models allow for the flexibility required in today's actuarial modeling environment

Independence

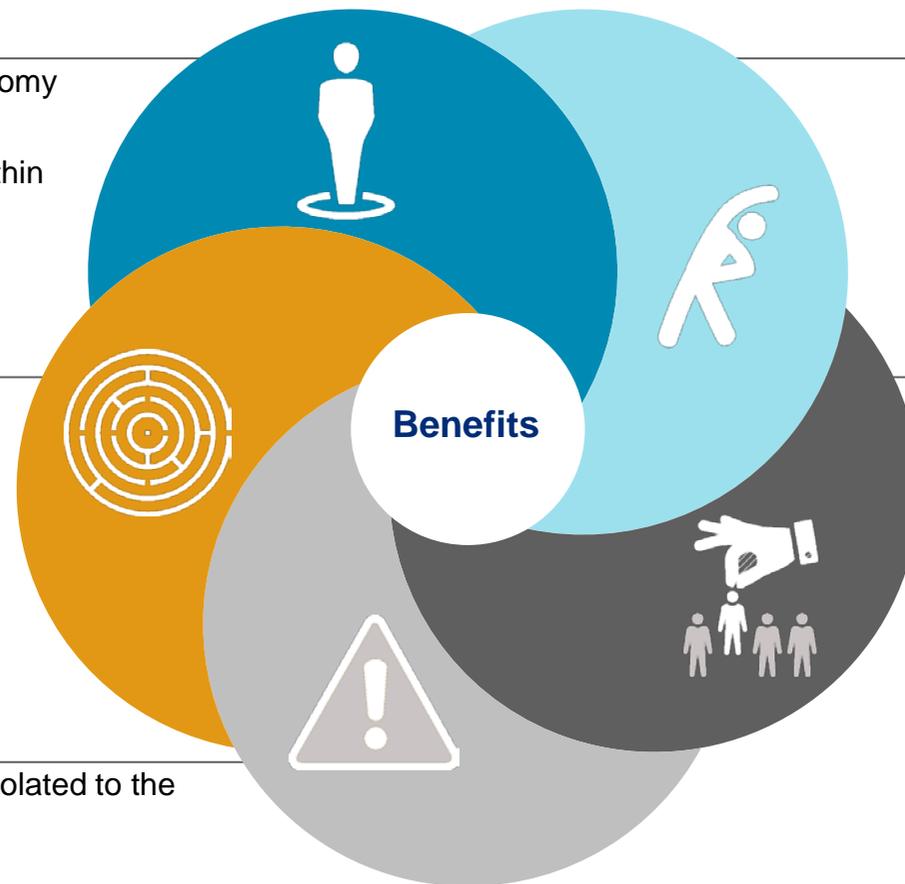
- Business units maintain autonomy around modeling decisions
- Models have a clear owner within each business unit

Complexity

- Business units can customize to the model purpose
- Models only need to include necessary components

Model risk

- Model issues and errors are isolated to the specific model



Flexibility

- Model updates can be quickly implemented
- Ad hoc runs can be completed on the fly

Modeling system

- Each business unit can use "best-in-class" system for the model purpose and business modeled

Challenges

Decentralized models may result in increased operational risks

Standardization

- Model input and output may differ materially between models
- Modeling systems have different limitations

Business unit silos

- May result in limited communication between business units

Model risk

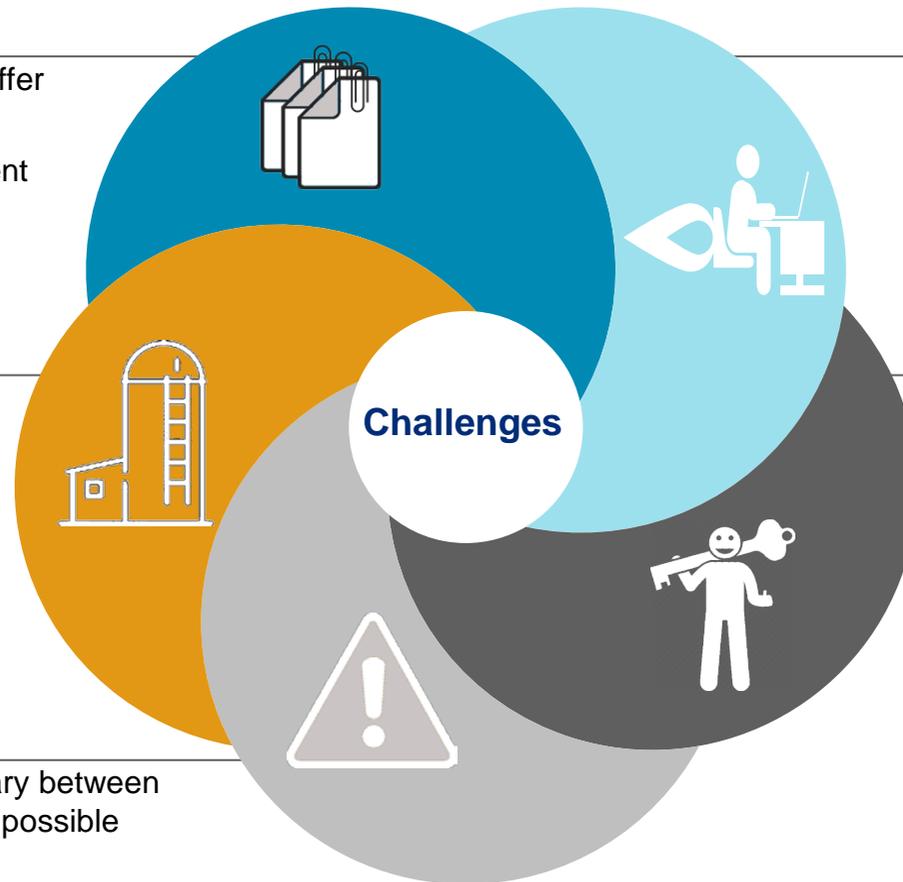
- Model output definition may vary between models or systems, leading to possible misinterpretations of results

Efficiency

- Decentralized models may result in duplication of effort

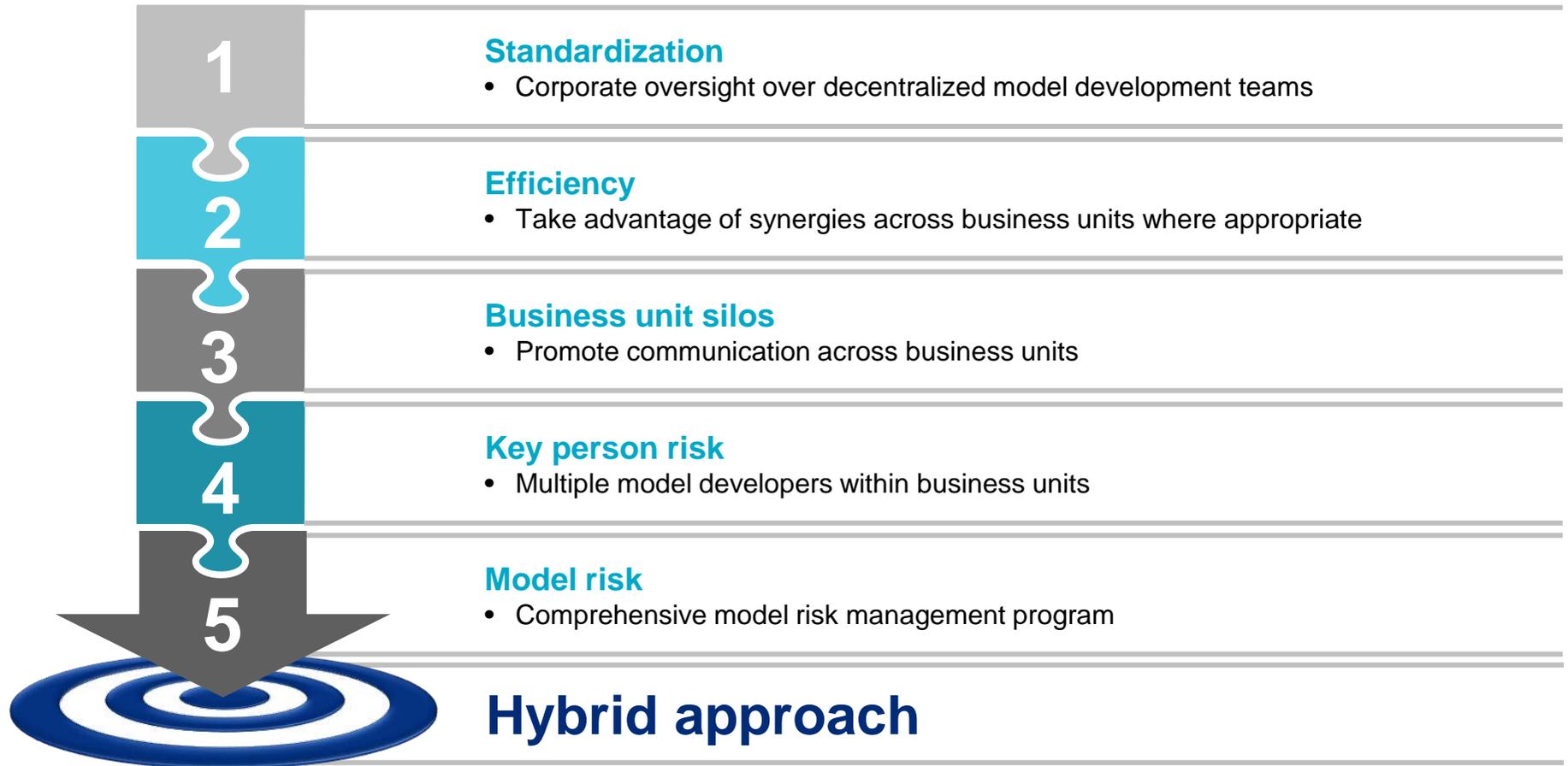
Key person risk

- Risk exists that only the dedicated model owner has knowledge of intricate model details



Potential solutions

A hybrid approach allows for the ideal balance of flexibility, robustness, and efficiency



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