

# Building a Risk System Using MATLAB

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**Aegon Asset Management**  
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## Key Takeaways

1. Developed in-house risk management system in MATLAB to have flexibility and control over functionality
2. System integrated in existing IT environment for daily execution
3. System integrated with a third party business intelligence tool

# Aegon Asset Management at a glance



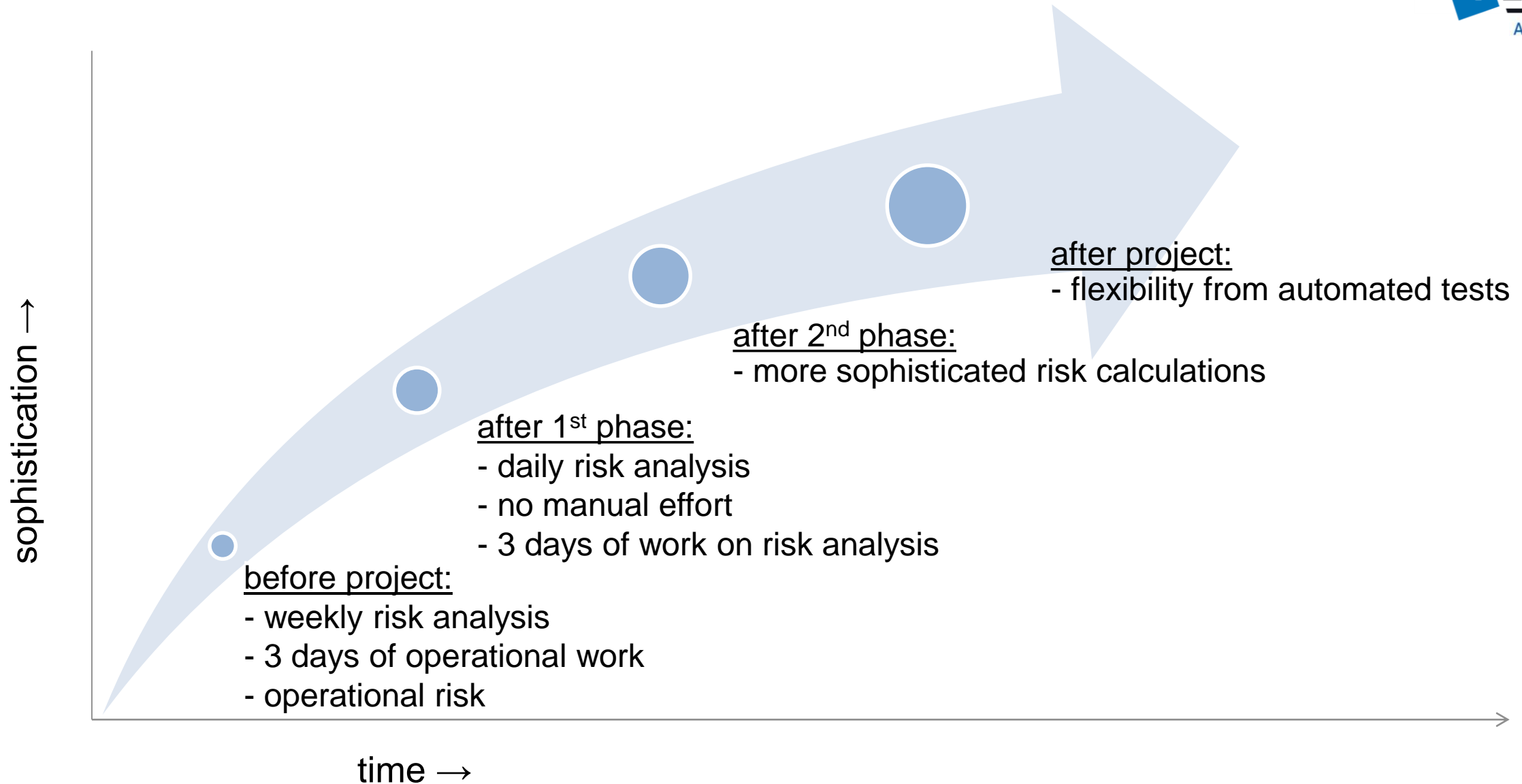
- Aegon Asset Management is a global asset manager
  - Investing our clients' money
- We are helping our clients to manage their financial future
  - Long term investments to meet long term obligations
  - Pension funds and other financial institutions
- Expertise in Fixed Income investment strategies
  - Government bonds, corporate bonds, etc.
- Currently managing € 340 billion assets worldwide

# Background

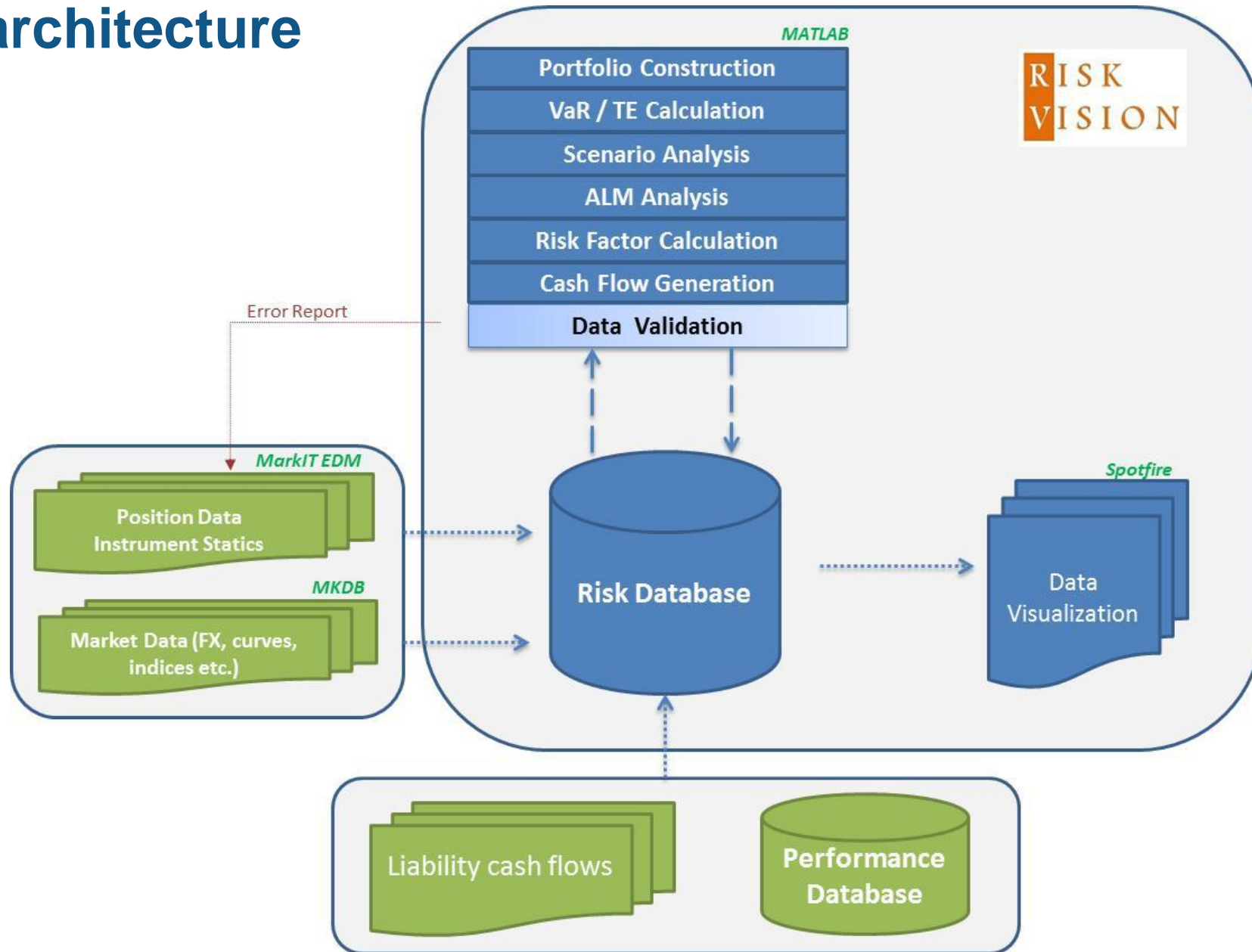


- Subprime debt crisis and government debt crisis in Greece increased risk awareness
- New government regulations require more sophisticated risk calculations
- Clients' focus on risk management increased
- Increase in the operational effort for risk management team

# Innovation Challenges and Achievements



# System architecture



# Demonstration of Risk Vision

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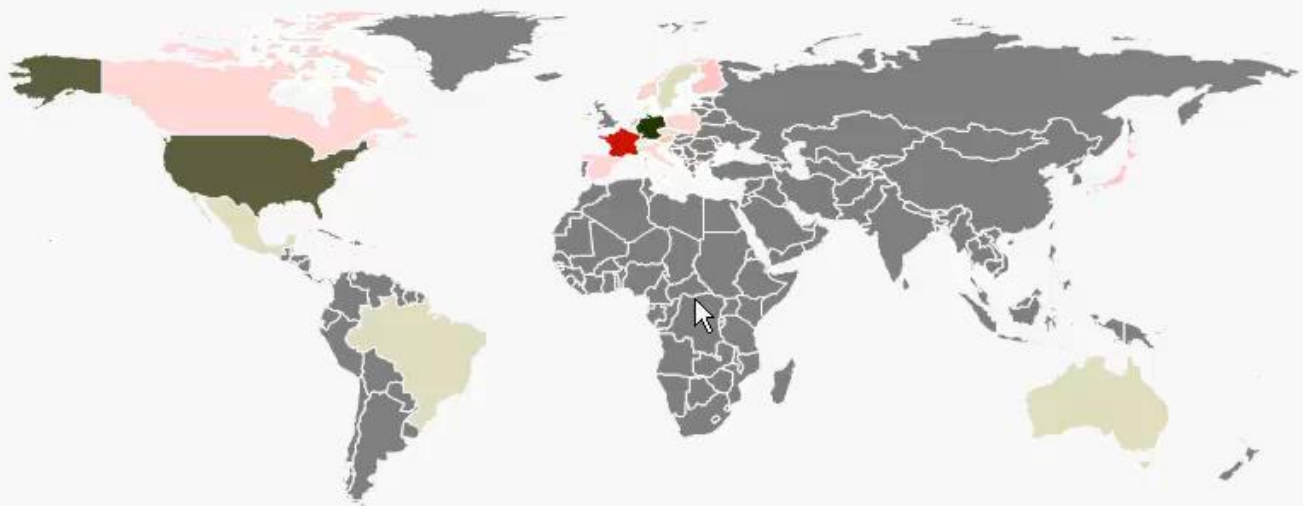
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222Demo SpotFire - Copy.dxp - TIBCO Spotfire

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Fund Active Positions - Treemap Dashboard Relative UnitPrice-spread Dashboard Absolute Performance DV01- Contributions per bucket GA Dashboard Page Fund Active Position

### RelativePosition by Country



RelativePosition by Sector

EN

Sum(Active position Last)

Sector	Color
BANKING	Red
BROKERAGE	Light Pink
CASH	Purple
CONSUMER_CYCLICAL	Green
ELECTRICAL	Pink
FINANCIALS	Light Green
FINANCIALS	Dark Green
INDUSTRIALS	Light Green
NATURAL_GAS	Light Pink
TECHNOLOGY	Light Green
TRANSPORTATION	Light Pink

Offline

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## How did we get there and leverage MathWorks

- MATLAB was used as the main calculation engine
- MATLAB was integrated with a data warehouse
- Multiple MATLAB toolboxes were used:
  - Parallel computing toolbox
  - Database toolbox
  - Statistics toolbox
  - Optimization toolbox
- The unit test framework in MATLAB was used for automated testing

# Why MATLAB?

- Easy to learn
- Enables focus on risk management
- Flexible!

## Concluding Remarks

complexity

flexibility

reliability

OO design

automated  
tests

DTAP street

error handling

- Giving Aegon Asset Management a competitive advantage in the current market

# Thank you!

**Peter Verhoog, Risk analyst, Portfolio Risk Management & Control**  
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