Cyber Risk Case Study: A Scenario-Based Approach to Identifying and Mitigating Key Threats

ERM Symposium
May 2, 2019

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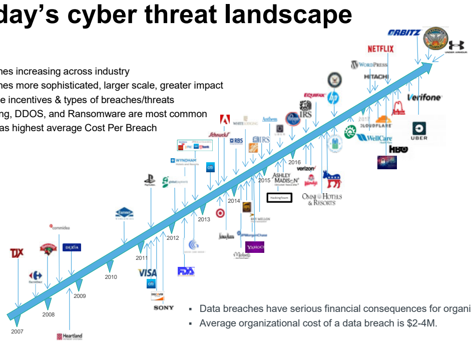
Agenda

- Current state of cybersecurity risks
- Value-based cyber risk management
- Applying value-based cyber risk management: Case study

CURRENT STATE OF CYBERSECURITY

Today’s cyber threat landscape

- Breaches increasing across industry
- Breaches more sophisticated, larger scale, greater impact
- Multiple incentives & types of breaches/threats
- Phishing, DDOS, and Ransomware are most common
- U.S. has highest average Cost Per Breach



- Data breaches have serious financial consequences for organizations
- Average organizational cost of a data breach is $2-4M.

Today’s cyber threat landscape

- Digital transformation will continue and therefore, cybersecurity landscape is constantly evolving.
- Today, we have 20 billion devices attached to the Internet. In 2020, we will have 50 billion devices connected to the Internet.
- Since hackers only need to be right once and those who protect the organization need to be right all the time, your cybersecurity program needs to be constantly evolving.
- In order to evolve, it is vital to understand who is after you, what motivates them, and what they are after.
- Understanding the landscape is a key element in any successful cybersecurity risk management program.

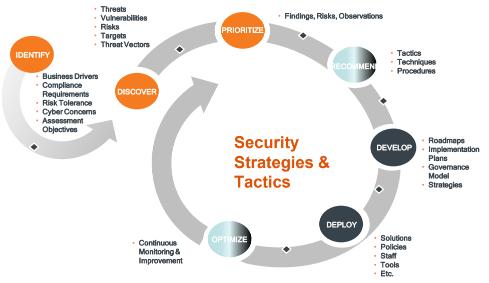
Businesses will be hacked because it’s easy

- Have not fully assessed their cyber risks
- Have not classified their data
- Don’t have latest security controls in place
- Many use social media to market their products and services
- Spend money in siloes
- Challenge to attract and retain internal security talents
- Use encrypted devices and unsecure emails for sensitive data
- Depend on third parties for various functions
- Most concerned about losing their customer data and bank account

What should they do to minimize attack impact?

- Start by assessing your cyber risks: What is core to your business; asset valuation and risk-based.
- Understand motives & drivers.
- Evaluate internal capabilities and outsource as appropriate.
- Incorporate key cybersecurity and privacy programs into your audit plans.
- Treat this as cost of running your business.
- Determine who has access to what.
- Classify and segment your critical data.
- Perform backups and patch management.
- Conduct ongoing security awareness training and social engineering testing.
- Have a tested Incident Response Plan

Cybersecurity lifecycle



IDENTIFY
- Business Drivers
- Compliance Requirements
- Risk Tolerance
- Cyber Concerns
- Assessment Objectives

DISCOVER
- Threats
- Vulnerabilities
- Risks
- Targets
- Threat Vectors

PRIORITIZE
- Findings, Risks, Observations

RECOMMENI
- Tactics
- Techniques
- Procedures

DEVELOP
- Roadmaps
- Implementation Plans
- Governance Model
- Strategies

DEPLOY
- Solutions
- Policies
- Staff
- Tools
- Etc.

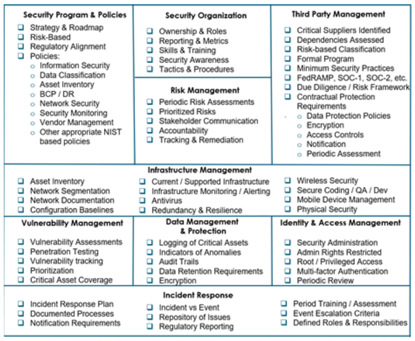
OPTIMIZE
- Continuous Monitoring & Improvement

Security Strategies & Tactics

Areas of cyber risk management

- Awareness & Training
- Policies & Procedures
- Application/ System Inventory
- Security Operations Center
- Software Patching
- Categorize Data
- Business Continuity Planning
- Cyber insurance
- Incident Response
- Third-Party Vendors
- Access Controls and Credential Management
- Configuration
- Spam Filters
- E-mail Detection
- People
- Anti-virus & Malware
- Macro Scripts
- Software Restriction Policies
- App Whitelisting

Components of a cybersecurity framework



Security Program & Policies

□ Strategy & Roadmap
□ Risk-Based
□ Regulatory Alignment
□ Policies:
  ○ Information Security
  ○ Data Classification
  ○ Asset Inventory
  ○ BCP / DR
  ○ Network Security
  ○ Security Monitoring
  ○ Vendor Management
  ○ Other appropriate NIST based policies

Security Organization

□ Ownership & Roles
□ Reporting & Metrics
□ Skills & Training
□ Security Awareness
□ Tactics & Procedures

Risk Management

□ Periodic Risk Assessments
□ Prioritized Risks
□ Stakeholder Communication
□ Accountability
□ Tracking & Remediation

Third Party Management

□ Critical Suppliers Identified
□ Dependencies Assessed
□ Risk-based Classification
□ Formal Program
□ Minimum Security Practices
□ FedRAMP, SOC-1, SOC-2, etc.
□ Due Diligence / Risk Framework
□ Contractual Protection Requirements
  ○ Data Protection Policies
  ○ Encryption
  ○ Access Controls
  ○ Notification
  ○ Periodic Assessment

Infrastructure Management

□ Asset Inventory
□ Network Segmentation
□ Network Documentation
□ Configuration Baselines
□ Current / Supported Infrastructure
□ Infrastructure Monitoring / Alerting
□ Antivirus
□ Redundancy & Resilience
□ Wireless Security
□ Secure Coding / QA / Dev
□ Mobile Device Management
□ Physical Security

Vulnerability Management

□ Vulnerability Assessments
□ Penetration Testing
□ Vulnerability tracking
□ Prioritization
□ Critical Asset Coverage

Data Management & Protection

□ Logging of Critical Assets
□ Indicators of Anomalies
□ Audit Trails
□ Data Retention Requirements
□ Encryption

Identity & Access Management

□ Security Administration
□ Admin Rights Restricted
□ Root / Privileged Access
□ Multi-factor Authentication
□ Periodic Review

Incident Response

□ Incident Response Plan
□ Documented Processes
□ Notification Requirements
□ Incident vs Event
□ Repository of Issues
□ Regulatory Reporting
□ Period Training / Assessment
□ Event Escalation Criteria
□ Defined Roles & Responsibilities

VALUE-BASED CYBER RISK MANAGEMENT

Obstacles in traditional cybersecurity risk management

1) Prioritizing focus amidst myriad cyber risks
2) Making the business case for mitigation decisions
3) Defining cyber risk appetite

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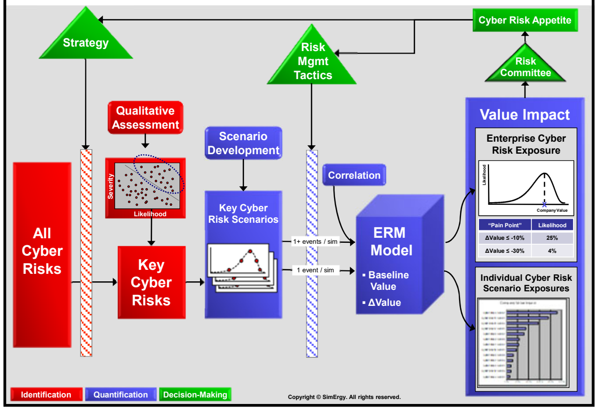
Value-Based Cybersecurity Risk Management



"Pain Point"	Likelihood
ΔValue ≤ -10%	25%
ΔValue ≤ -30%	4%

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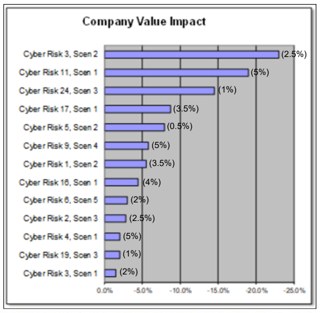
Quantifying individual cyber risk scenarios



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1) Prioritizing focus amidst myriad cyber risks

Traditional Approach		Value-based Approach
Method 1: Qualitative	Cannot support decision-making	Quantifies impact to value / supports decision-making
Method 2: Industry data	Often unavailable, inappropriate, static	Available, company/situation-specific, dynamic
Method 3: Risk capital	Arbitrary / often directionally incorrect	Risk-based

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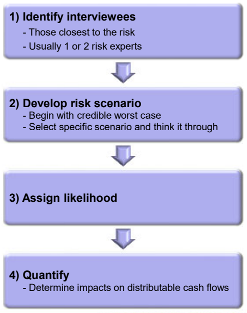
ILLUSTRATIVE EXAMPLE

Developing risk scenarios: FMEA

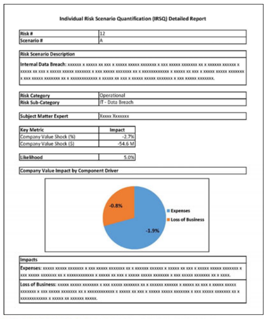


1) Identify interviewees
- Those closest to the risk
- Usually 1 or 2 risk experts

2) Develop risk scenario
- Begin with credible worst case
- Select specific scenario and think it through

3) Assign likelihood

4) Quantify
- Determine impacts on distributable cash flows



Individual Risk Scenario Quantification (IRSQ) Detailed Report

Risk #	12
Scenario #	A

Risk Scenario Description

Internal Data Breach: xxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxx xxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxxxxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxxxxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx.

Risk Category	Operational
Risk Sub-Category	IT - Data Breach

Subject Matter Expert	Xxxxx Xxxxxxx

Key Metric	Impact
Company Value Shock (%)	-2.7%
Company Value Shock ($)	-54.6 M

Likelihood	5.0%

Company Value Impact by Component Driver

Impacts

Expenses: xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxx xxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxxxxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxx.

Loss of Business: xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxx xxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxxxxxxxx x xxxxx xx xxx x xxxxx xxxxx xxxxxxx x xxx xxxxx xxxxxxx xx x xxxxxxxxxxxx x xxxxx xx xxxxxx xxxxx.

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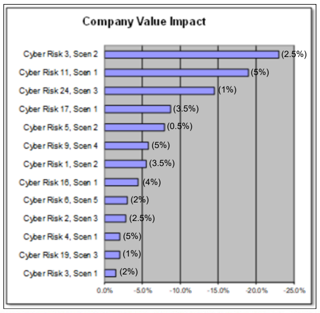
Prioritizing focus through quantification



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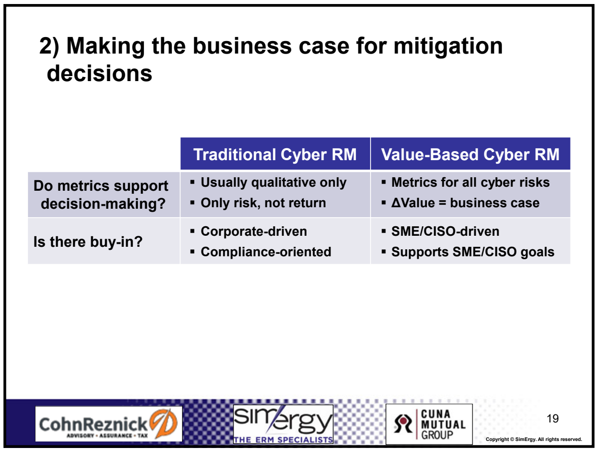

2) Making the business case for mitigation decisions

	Traditional Cyber RM	Value-Based Cyber RM
Do metrics support decision-making?	▪ Usually qualitative only ▪ Only risk, not return	▪ Metrics for all cyber risks ▪ ΔValue = business case
Is there buy-in?	▪ Corporate-driven ▪ Compliance-oriented	▪ SME/CISO-driven ▪ Supports SME/CISO goals

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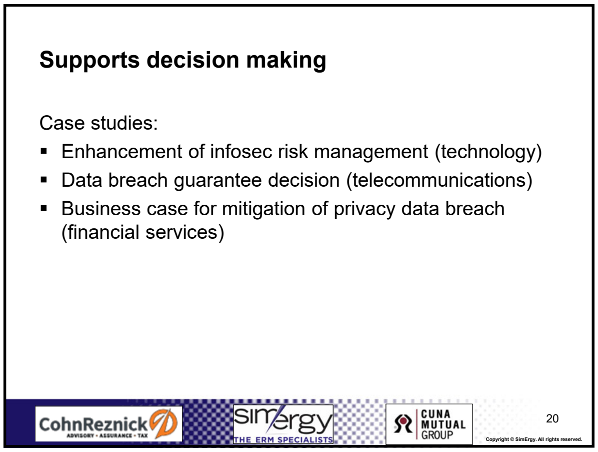

Supports decision making

Case studies:

- Enhancement of infosec risk management (technology)
- Data breach guarantee decision (telecommunications)
- Business case for mitigation of privacy data breach (financial services)

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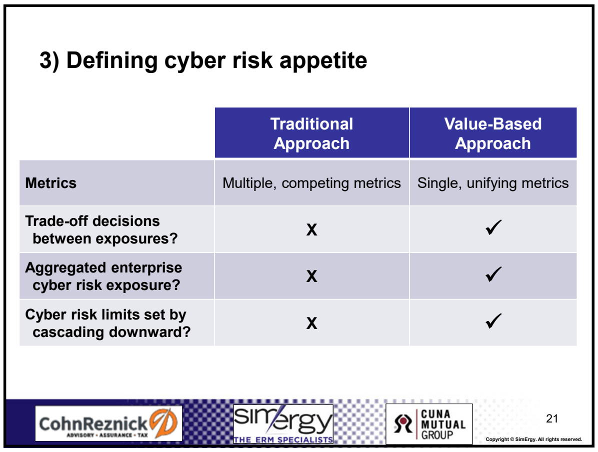

3) Defining cyber risk appetite

	Traditional Approach	Value-Based Approach
Metrics	Multiple, competing metrics	Single, unifying metrics
Trade-off decisions between exposures?	X	✓
Aggregated enterprise cyber risk exposure?	X	✓
Cyber risk limits set by cascading downward?	X	✓

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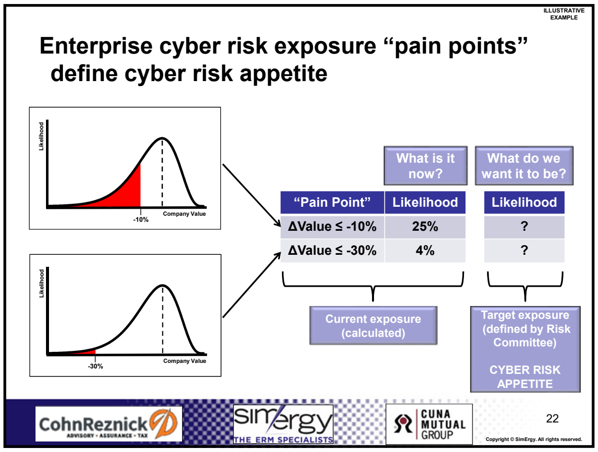

ILLUSTRATIVE EXAMPLE

Enterprise cyber risk exposure "pain points" define cyber risk appetite

	What is it now?	What do we want it to be?
"Pain Point"	Likelihood	Likelihood
ΔValue ≤ -10%	25%	?
ΔValue ≤ -30%	4%	?

Current exposure (calculated)

Target exposure (defined by Risk Committee)

CYBER RISK APPETITE

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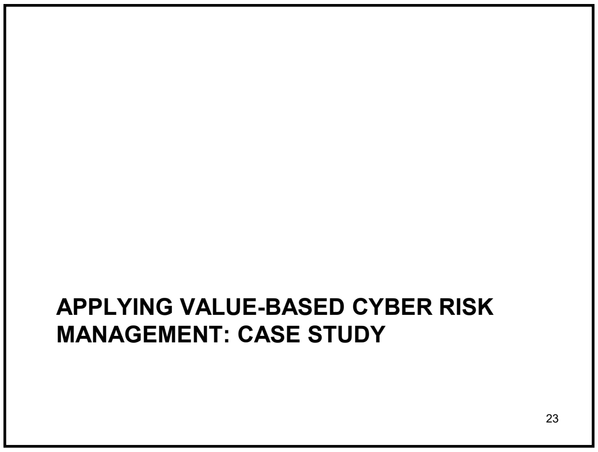
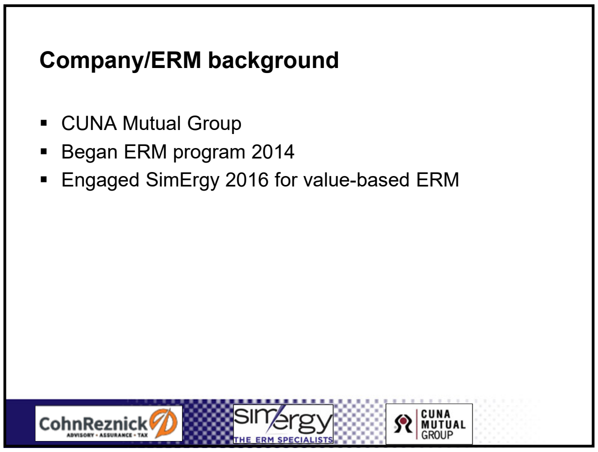
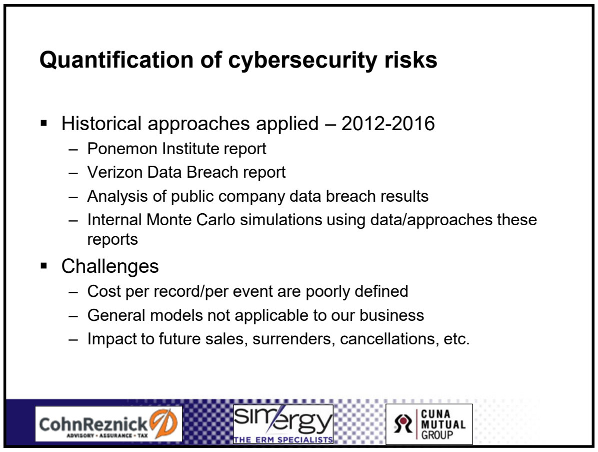


APPLYING VALUE-BASED CYBER RISK MANAGEMENT: CASE STUDY



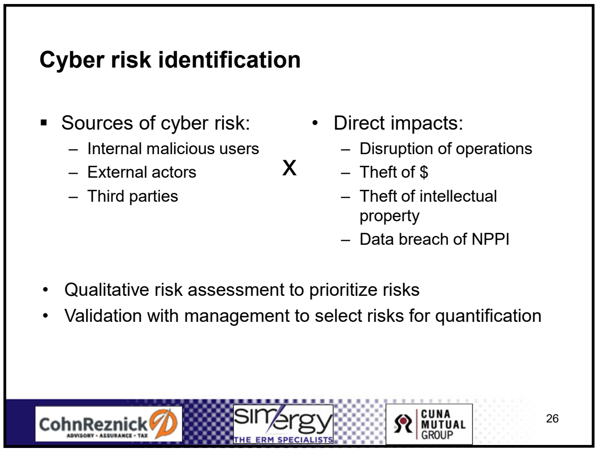
Company/ERM background

- CUNA Mutual Group
- Began ERM program 2014
- Engaged SimErgy 2016 for value-based ERM



Quantification of cybersecurity risks

- Historical approaches applied – 2012-2016
  - Ponemon Institute report
  - Verizon Data Breach report
  - Analysis of public company data breach results
  - Internal Monte Carlo simulations using data/approaches these reports
- Challenges
  - Cost per record/per event are poorly defined
  - General models not applicable to our business
  - Impact to future sales, surrenders, cancellations, etc.



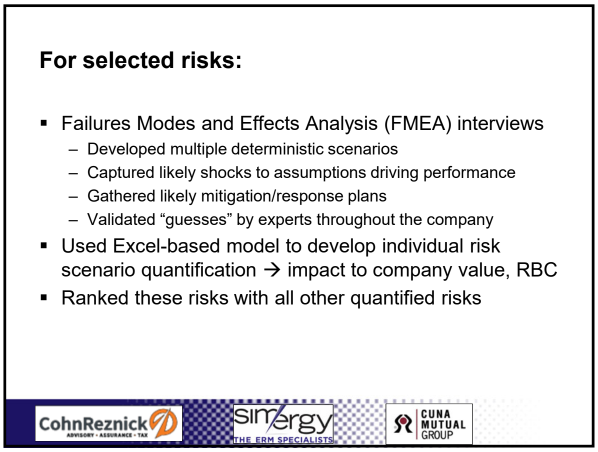
Cyber risk identification

- Sources of cyber risk:
  - Internal malicious users
  - External actors
  - Third parties

X

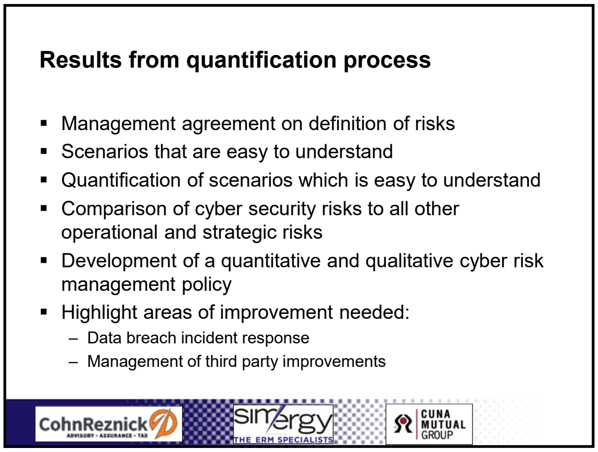
- Direct impacts:
  - Disruption of operations
  - Theft of $
  - Theft of intellectual property
  - Data breach of NPPI

- Qualitative risk assessment to prioritize risks
- Validation with management to select risks for quantification



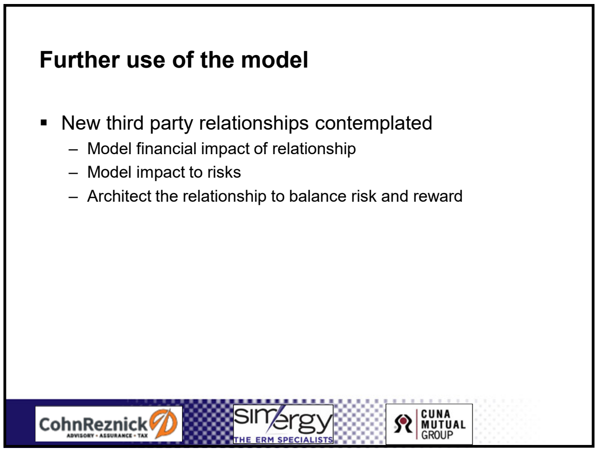
For selected risks:

- Failures Modes and Effects Analysis (FMEA) interviews
  - Developed multiple deterministic scenarios
  - Captured likely shocks to assumptions driving performance
  - Gathered likely mitigation/response plans
  - Validated “guesses” by experts throughout the company
- Used Excel-based model to develop individual risk scenario quantification → impact to company value, RBC
- Ranked these risks with all other quantified risks



Results from quantification process

- Management agreement on definition of risks
- Scenarios that are easy to understand
- Quantification of scenarios which is easy to understand
- Comparison of cyber security risks to all other operational and strategic risks
- Development of a quantitative and qualitative cyber risk management policy
- Highlight areas of improvement needed:
  - Data breach incident response
  - Management of third party improvements



Further use of the model

- New third party relationships contemplated
  - Model financial impact of relationship
  - Model impact to risks
  - Architect the relationship to balance risk and reward

Contact information

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