Robots and Risk Management

Speakers:

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Learning Objectives

At the end of this session, you will:

- **Be able to formulate risk management tactics and strategies that create value for the Enterprise**
- **Design a risk management strategy to manage risk associated with disruptive technologies**
- **Leverage collective learning to improve their ability to manage new and emerging threats**

Agenda

Knowledge doubling curve

Disruptive technologies

- Robots, Artificial Intelligence (AI), Deep Learning

The need for change, making the case

- Malware, ransomware, hardware vulnerabilities, criminal enterprise, economic impact

Bimodal risk management

- Next generation risk management

Strategy and tactics for the future

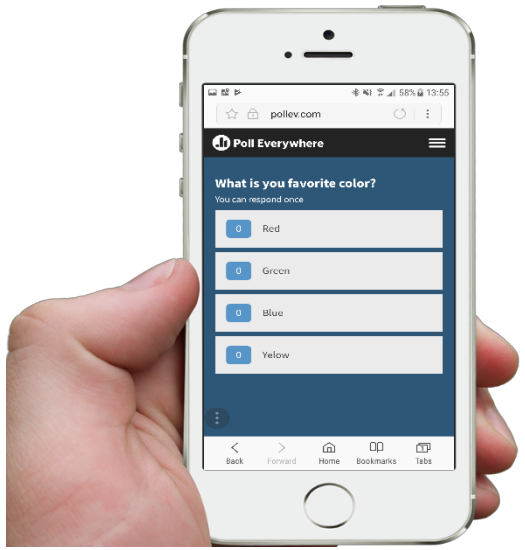
- Collective learning, quantitative risk management,

Conclusion and Q&A

Please ask questions throughout!

Answering the Poll Questions

Attendees can participate by answering polling questions during the event.



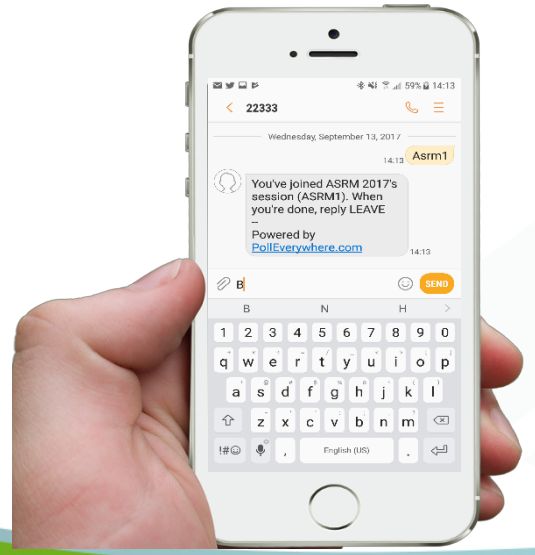
To do so, please use your own mobile device and go to **pollev.com/RIMS3**

Attendees do not need to log in to answer the questions.

When you go to a new room you must enter the new URL pollev.com/keyword

Each room has a unique keyword.

OR



Use your own mobile device and **Text: RIMS3 to the number 22333**

You will receive a confirmation message that you have joined the session. Then simply respond with the letter of your choice for each question.

If you leave and go to another room text **LEAVE** to exit the session then text the new keyword for the new room.

RIMS the risk management society

Polling Question

What is your role in your current organization?

A. CRO
B. Director
C. Risk Manager
D. Other

What is your role in your current organization?

RIMS the risk management society

Knowledge Doubling Curve

What is knowledge?

- Information and skills acquired through experience or education

Who is Buckminster Fuller?

- American futurist, prominent author, university professor, and inventor of the geodesic dome

What is the knowledge doubling curve?

- Measures the rate of change associated with the common knowledge of humankind

How does the knowledge doubling curve affect risk management?

- Risk practitioners must imagine the unprecedented
- Risk practitioners must develop risk scenarios based on the art of the possible, not just known risk events; focus on the tail

Disruptive Technologies

Robots, both technology robots (aka Bots) and industrial robots

Artificial intelligence (AI)

Deep learning

Internet of Things (IoT)

Robots building robots, audited by robots, and communicating with other robots

Disruptive Technologies

Technology robots

Bots made up 52% of all Internet traffic in 2016

- Good Bots (search engines, monitors, crawlers, feeds, auditors) – 23%
- Bad Bots (impersonators, scrapers, spammers, hackers) – 29%

A 2016 McKinsey Group report suggests Bots can take over entire business processes

- McKinsey Group estimates 286,000 attorney and 70,000 paralegal position are at risk of elimination by technology robots
- 50% of the work in the finance and insurance sectors
- 90% of mortgage application processes

Disruptive Technologies

Artificial intelligence (AI)

- A Stanford University exercise revealed that artificial intelligence systems from Alibaba and Microsoft performed better than humans in a reading comprehension test.

Google's DeepMind AI mastered 1,500 years of chess knowledge in 4 hours

- DeepMind learned chess from scratch after only being programmed with the rules
- DeepMind also developed new chess strategies never before seen by grandmasters
- Recommendation: AlphaGo documentary (https://www.alphagomovie.com)

Deep learning

- Autonomous transportation will eliminate 1.7 million truck driver jobs in the next decade

Internet of things (IoT)

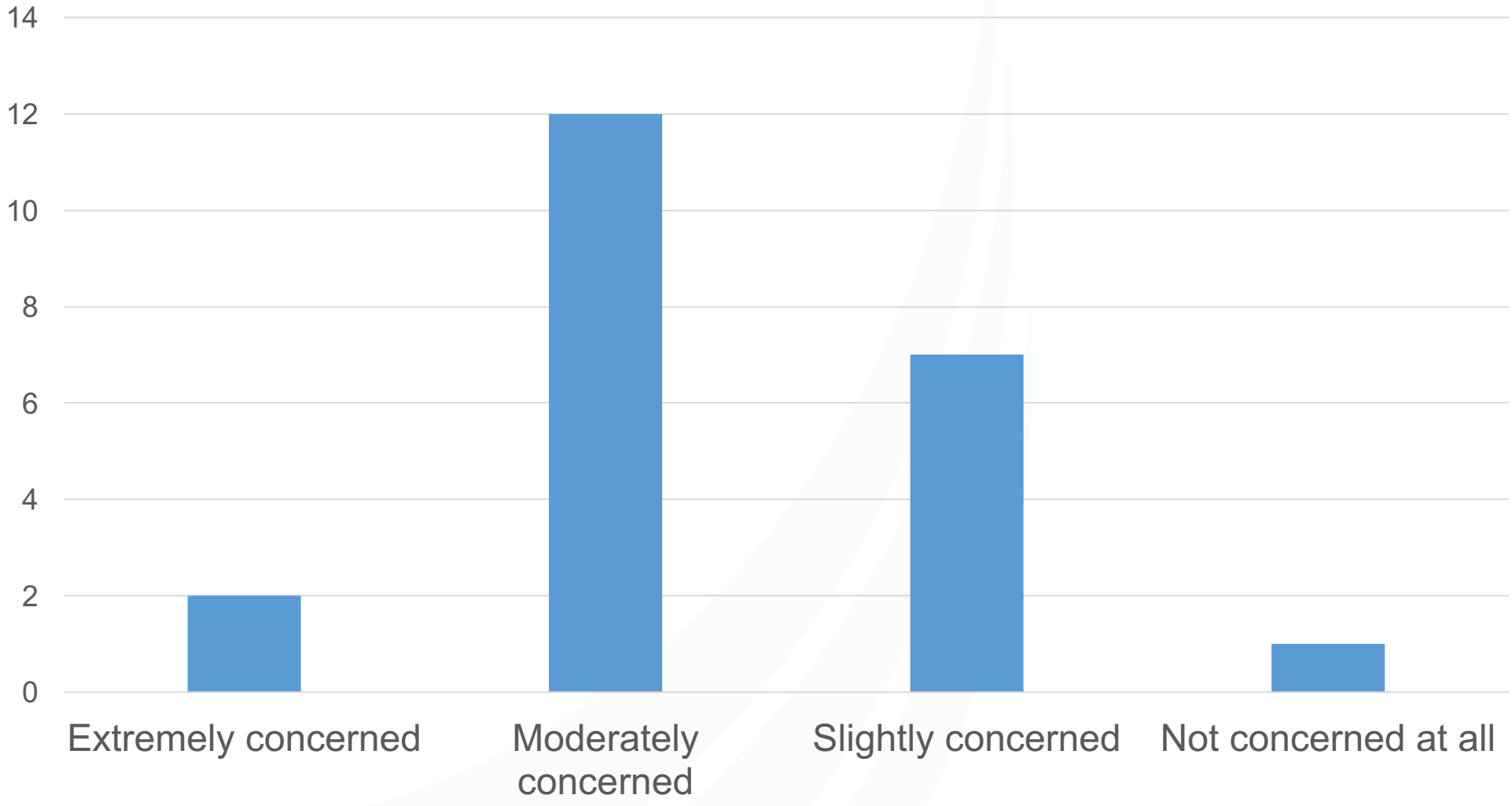
- 31 million smart homes in North America in 2016
- Experts predict smart homes in North America & Europe exceed 150 million by 2021

Polling Question

How concerned are you about disruptive technologies?

A. Extremely concerned
B. Moderately concerned
C. Slightly concerned
D. Not concerned at all

How concerned are you about disruptive technologies?



The Need for Change, Making the Case

Chip manufacturers produce an estimated 40 billion microprocessors each year

The Meltdown and Spectre CPU flaws were able to be patched

Consider the following scenario

- Industrial robots manufacture tens of billions microprocessors based on a flawed design produce by AI
- The design flaws can't be patched and must be recalled
- What is the impact of recalling 20 billion or 30 billion consumer products and industrial machines?
- How do we manage this risk?

Disruptive technologies dramatically increases the likelihood of this scenario

The Need for Change, Making the Case

2015 Data Breach Investigations report found that 5 malware events occur every second

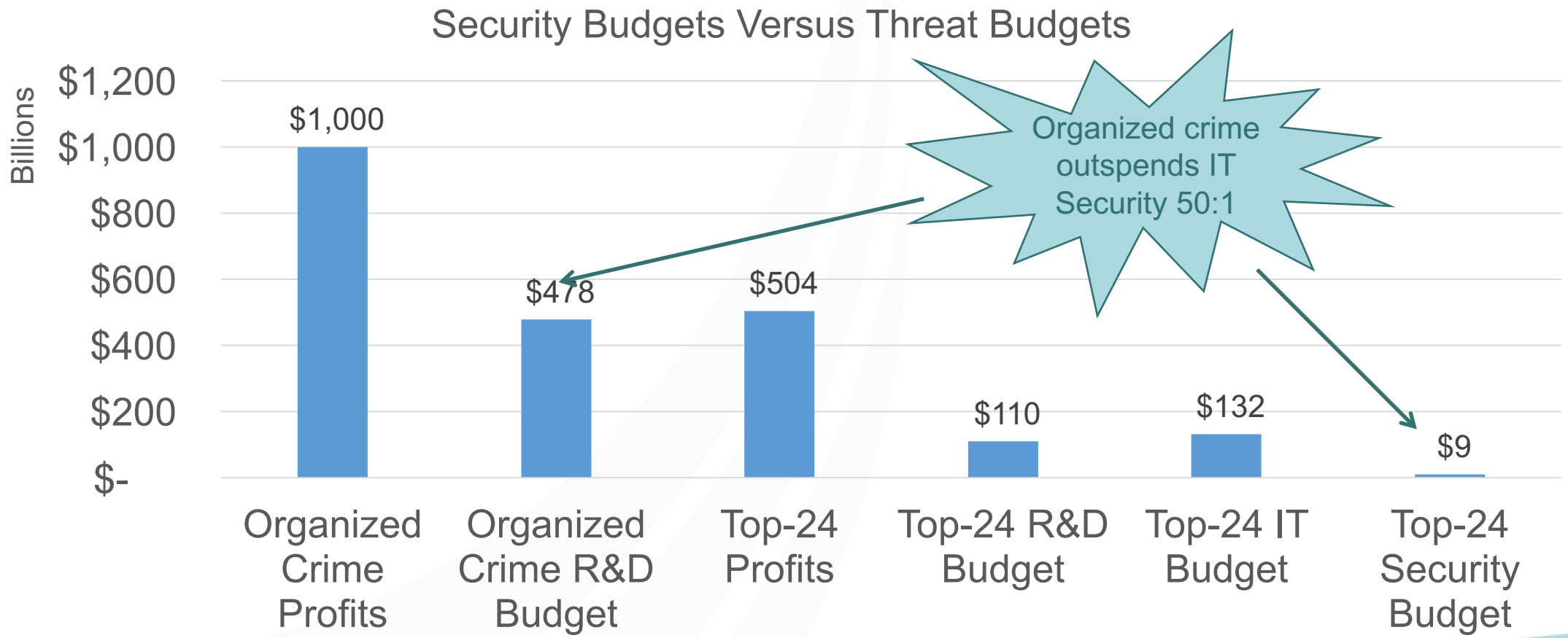
In 2016 companies lost an estimated $1.5 billion to ransomware

In 2017 WannaCry ransomware infected more than 200,000 computers, losses expected to exceed $4 billion

Nearly 40% of insider misuse cases were by end users, not necessarily privileged users

Risk events are occurring more rapidly than ever before and loss events are increasing exponentially

The Need for Change, Making the Case



The Need for Change, Making the Case

Risk theory began in the mid-1500s

150 years

Actuarial science emerged in the early 1700s

250 years

Modern risk management emerged in the mid-1950s

Can we wait another 50 years for the next evolution of risk management?

What is the next evolution of risk management?

Bimodal Risk Management

Bimodal describes the management of two related but separate practices

Mode 1

- Produces consistent, reliable results
- Associated with predictable, stable, low-risk operations

Mode 2

- Exploratory and seeks to push the innovation envelope

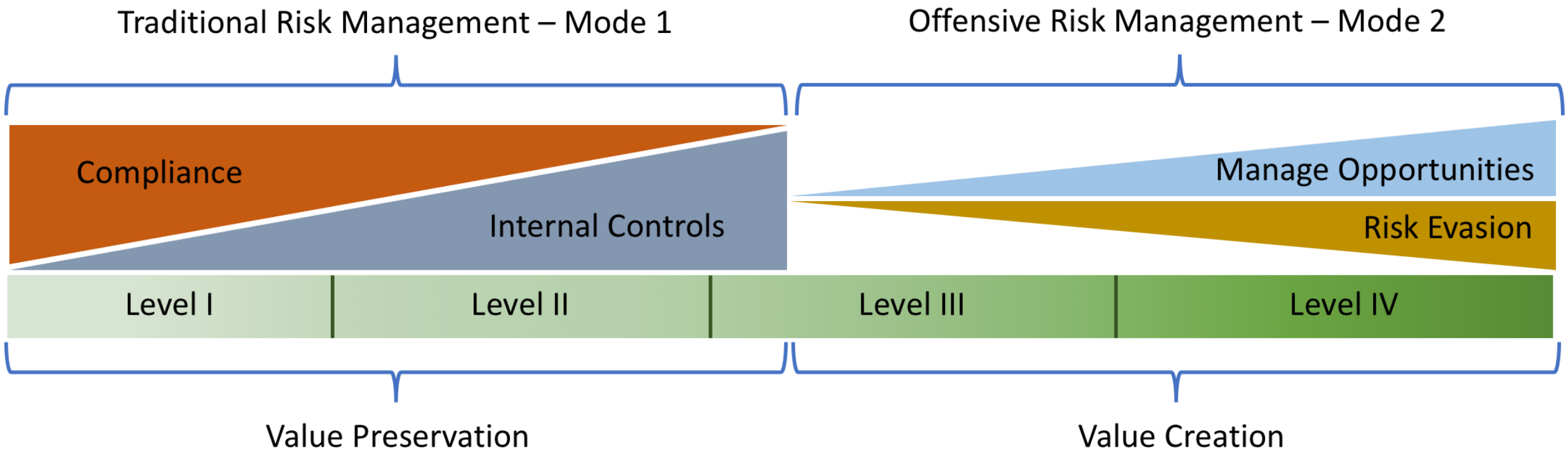
What is bimodal risk management?

- A holistic, strategic risk management approach
- Extends and expands proven risk management tactics to account for disruptive technologies

Why do we need bimodal risk management?

- Traditional risk management practices are slow to evolve
- We must manage risk events that are predicable AND those that are highly unpredictable

Bimodal Risk Management (BRM)



Bimodal Risk Management

Mode 1 satisfies compliance requirements and preserves existing value (narrow)

- Keep doing what we you're doing

Mode 2 creates new value and aggressively ferrets out emerging threats (expansive)

- Extend the boundary of the Enterprise
- Embrace collective learning (learn from events impacting other industries)
- Expand the use of detective and preventive controls

Risk Management Maturity

Level I – Ad Hoc

- Ad hoc processes are inconsistently applied across the organization

Level II – Defined

- Well defined risk management processes
- Qualitative risk metrics

Level III – Quantitative

- Risk governance guides risk management practices
- Organization focuses on risk management effectiveness metrics
- Quantitative risk metrics

Level IV – Optimized

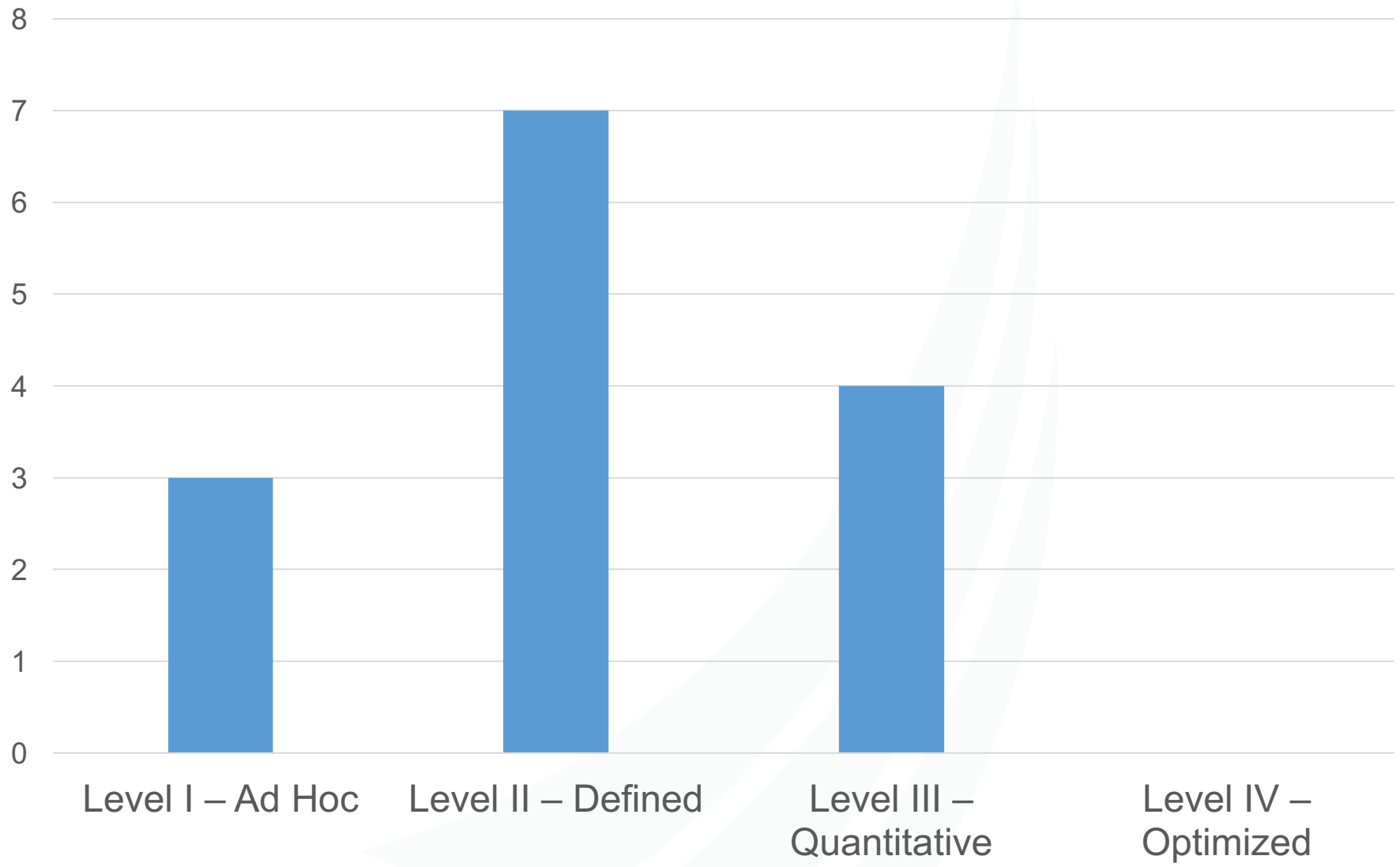
- Fully institutionalized risk management processes
- Extensive use of key risk indicators (KRI)
- Metrics quantitatively demonstrate risk reduction
- Strategy and objectives are fully integrated

Polling Question

What is the risk maturity level of your organization?

A. Level I – Ad Hoc
B. Level II – Defined
C. Level III – Quantitative
D. Level IV – Optimized

What is the risk maturity level of your organization?



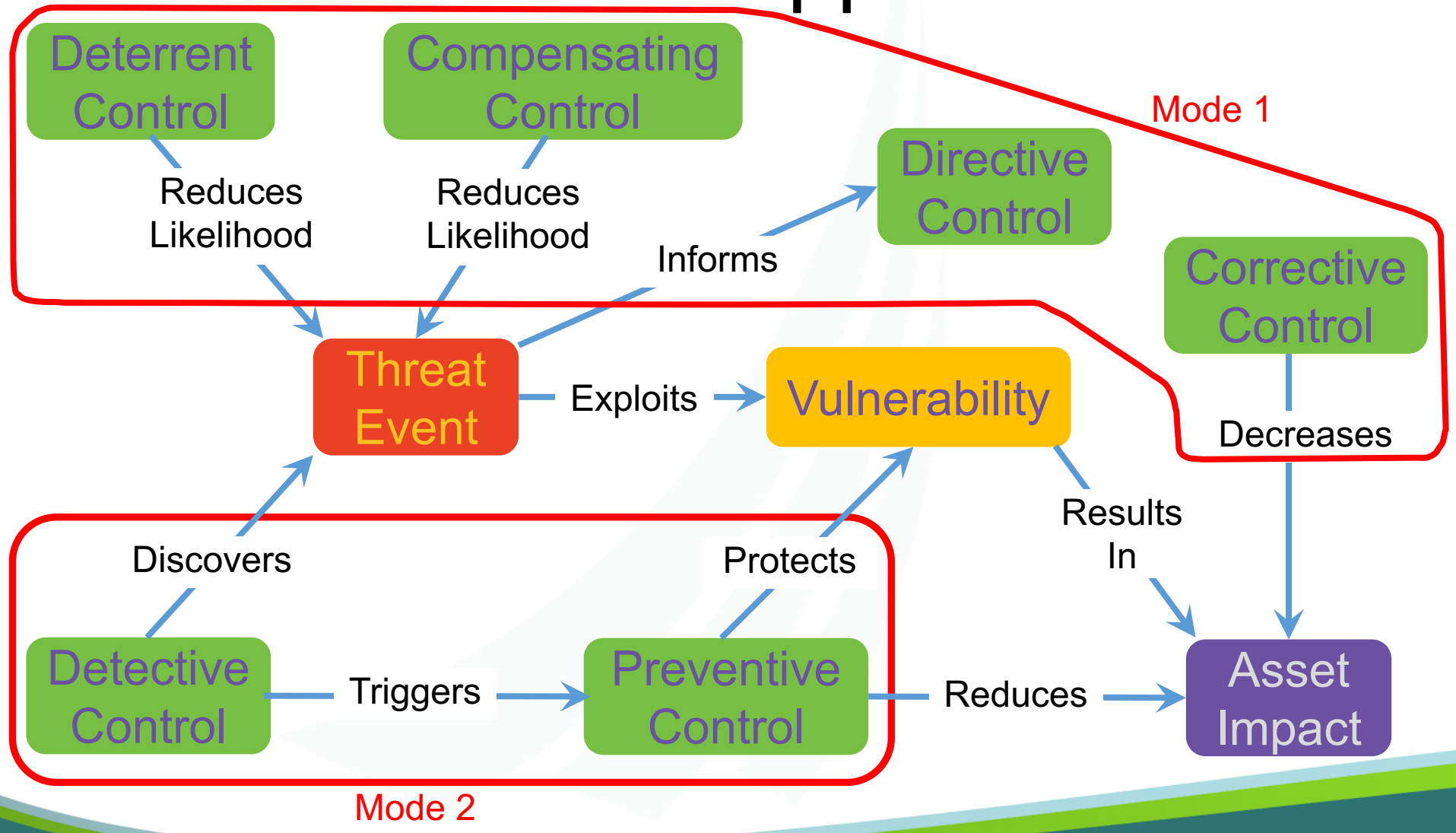
BRM – A Heuristic Approach

Offensive risk management: a heuristic approach

Heuristic (adjective | heu·ris·tic | \hyu̇-ˈri-stik\)

- Problem-solving by experimental and especially trial-an-error methods
- Exploratory problem-solving techniques that utilize self-educating techniques to improve performance

BRM – A Heuristic Approach



BRM – A Heuristic Approach

Detective controls provide warnings of policy violations or emerging threats

Mode 1 detective controls

- Audits
- Intrusion detection systems (IDS)
- Motion detectors

Mode 2 detective controls

- Internal password cracking
- Honey pots
- ”Cyber Monday”
- Active participation in industry associations (e.g. Black Hat, US-CERT C^3 Voluntary Program)

BRM – Offensive Risk Management

Preventive controls prevent attempts to violate policy and seeks to prevent asset vulnerabilities from affecting mission accomplishment

Mode 1 Preventive controls

- Sterile procedures in medical environments prevent infection
- Hazard analysis and critical control points (HACCP) prevents food contamination

Mode 2 Preventive controls

- Sponsor collective learning organizations to help identify preventive controls for emerging threats

Strategy and Tactics for the Future

Strategy:

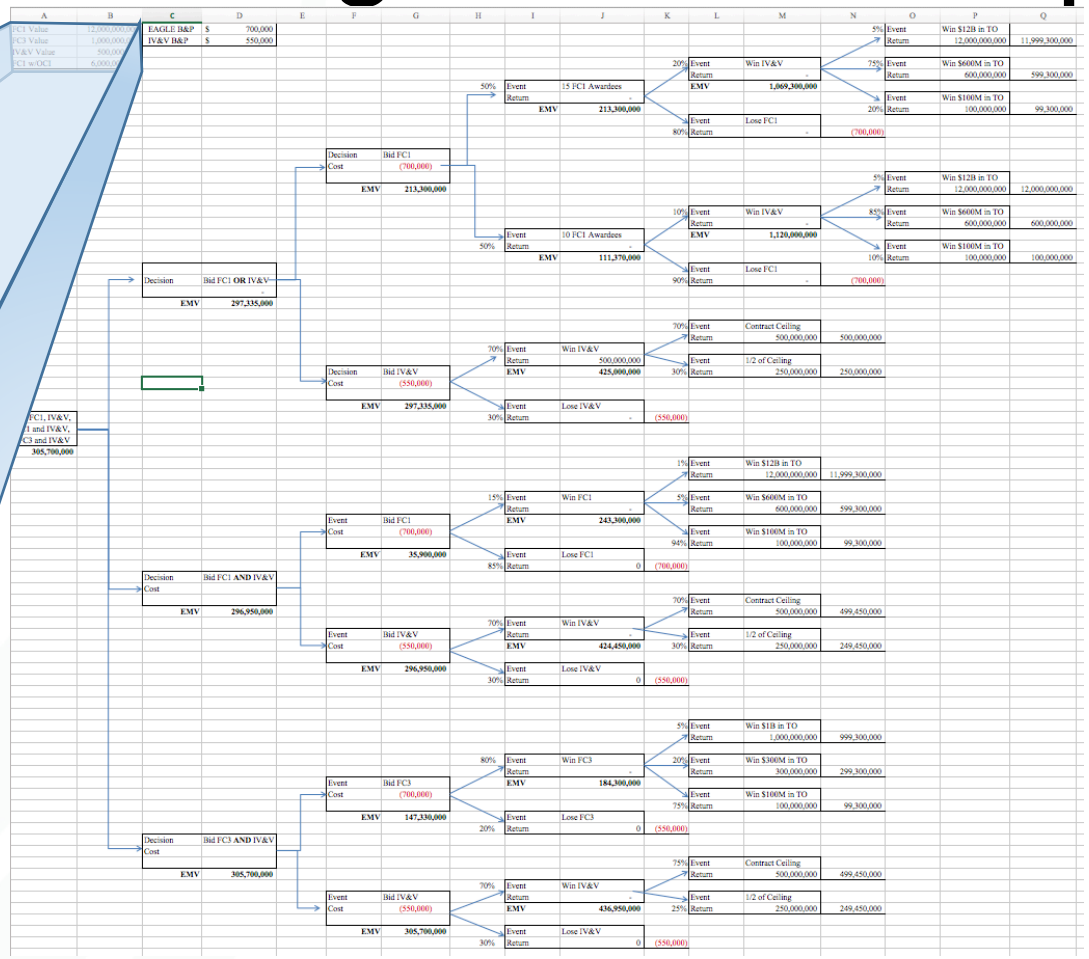
- **Bimodal risk management**
  - Increase use of detective controls
  - Heuristic auditing
  - Go all-in with Mode 2
- **Leverage disruptive technologies to aggressively pursue opportunities**
  - Bots for internal audits; move toward 100% audit
  - Use AI to identify emerging threats
  - Bots for automated reporting and escalation to humans

Tactics:

- **Collective learning**
- **Quantitative risk management**
  - RiskLens
  - Expected Monetary Value (EMV)

Quantitative Risk Management Example

FC1 Value	12,000,000,000
FC3 Value	1,000,000,000
IV&V Value	500,000,000
FC1 w/OCI	6,000,000,000



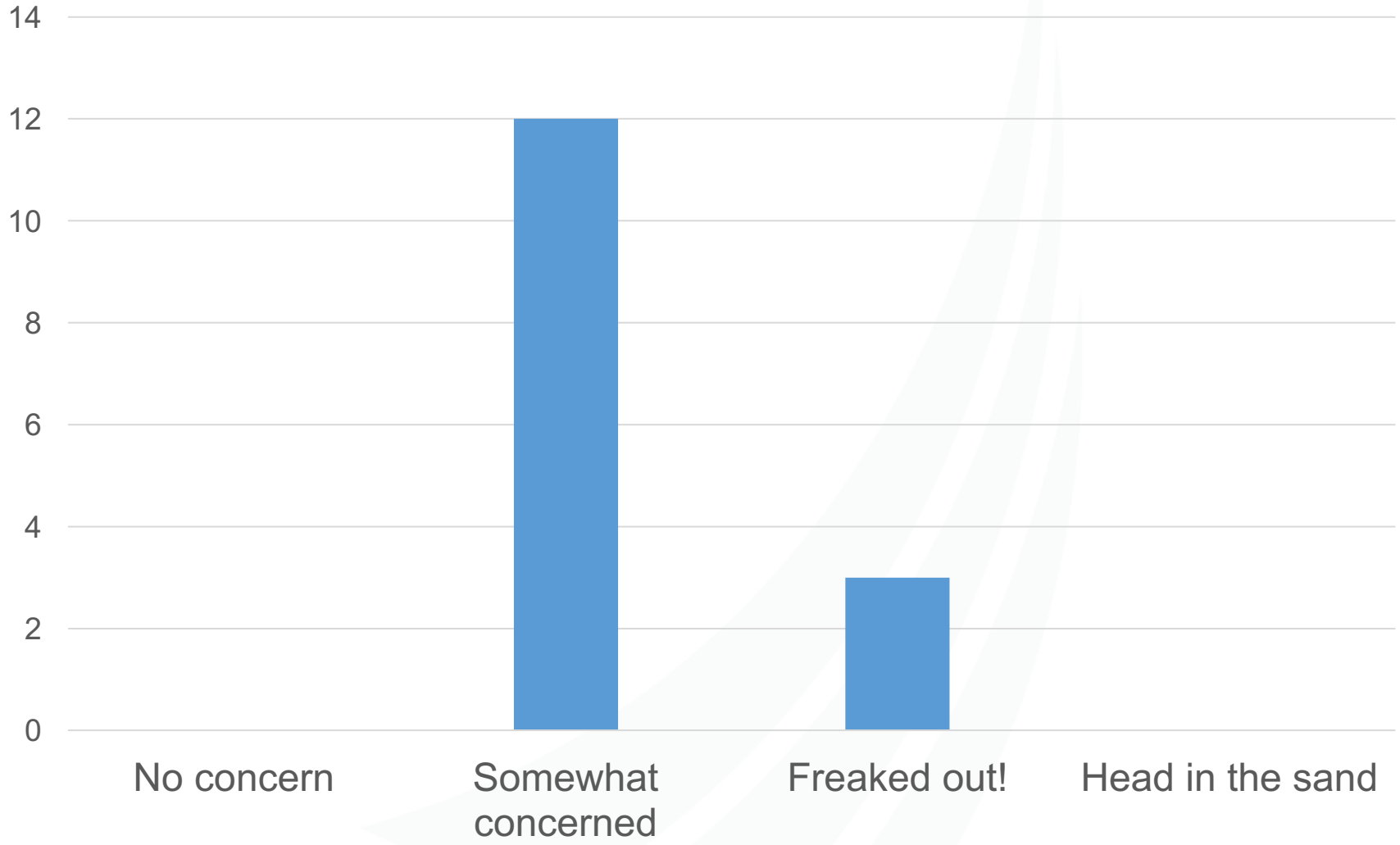
Expected monetary value (EMV) chart used to make bid/no-bid decision on multi-billion dollar bid

Polling Question

Describe your level of concern about disruptive technologies

A. No concern
B. Somewhat concerned
C. Freaked out!
D. Head in the sand

Describe your level of concern about disruptive technologies



Conclusion

Disruptive technologies will drive rapid evolution of unforeseen risk events

Disruptive technologies gives the criminal enterprise greater capability than ever before

Organizations must collaborate globally to cope with the rapid emergence of new threats

- Cooperation has become the optimum survival strategy -- Buckminster Fuller

Extend the boundary of the Enterprise to provide more lead-time to develop internal controls and risk treatment plans

ERM must become more proactive and embrace heuristics

- Chance favors the prepared mind – Louis Pasteur

Thank you!