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Where Cyber Security Meets Insurance:
Challenges Presented and Opportunities Created

October 2016

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Cyber is one of the most attractive opportunities to emerge in the global insurance industry in decades

> “This is the hottest insurance product that has come out in my 40-year career”
>
> **- President, Betterley Risk Consultants**

> “It is very rare in an insurance person's career that a new product not only takes off but provides real benefit and value to the insureds, that's seen as a must-have product.”
>
> **- Paul Bantick, Beazley**

> “Cybersecurity insurance has a very, very bright future for insurers … it fills a gap, a void, that virtually every business in America has”
>
> **- CEO, Insurance Information Institute**

Cyber crime costs **>$400B** per year but **<1%** is covered by insurance today

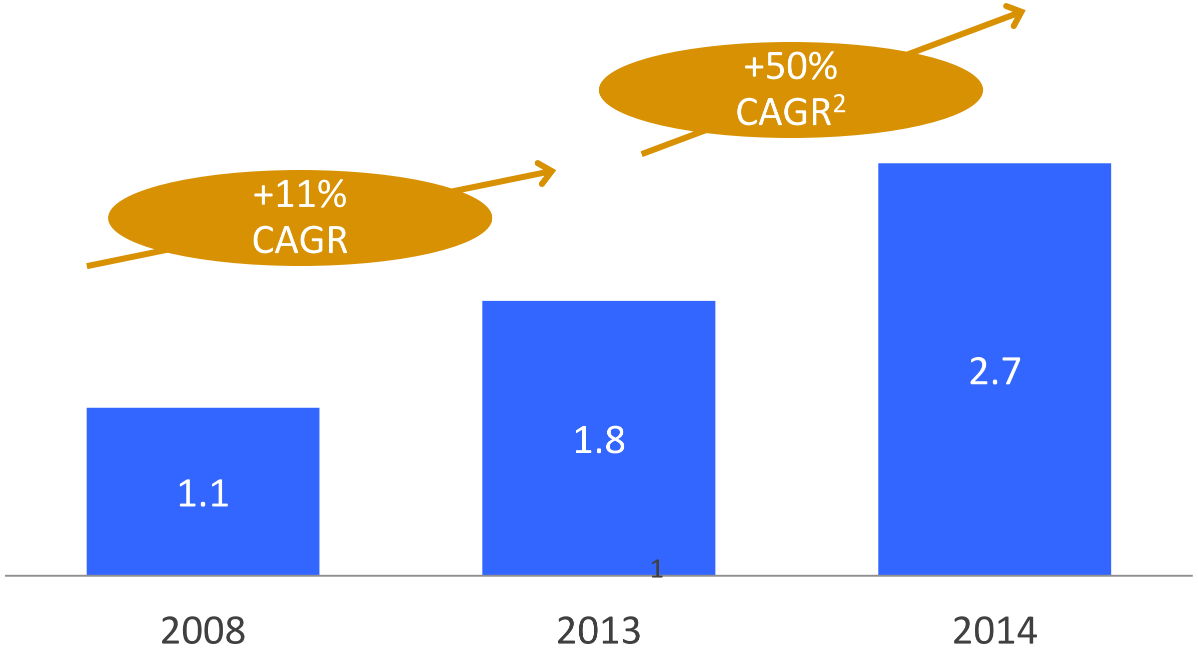
35-50% premium revenue growth per year, expected to grow to **$10-15B+**

>800 $1B+ revenue companies buying cyber insurance in next **3** years

Limited focus on consumer and micro-business to-date

Cyber insurance: $2.7B market experiencing rapid growth and expected to at least triple in size within 5 years

Global cyber insurance market
Gross written premiums (US$B)



- Market dominated by the US
  - 85% US
  - 10% EU (rapid growth expected)
  - 5% Rest of World
- High demand from clients, with annual growth estimates from 2016 onwards ranging from 35-50%
- Industry projected to be between 3-8x the size within 5 years, or $7-20B globally

[1] IBIS estimate of $2B vs $1.8B for UK Government/Marsh report
[2] UK Government/Marsh global estimate of 50%, Betterley report estimate of 35%

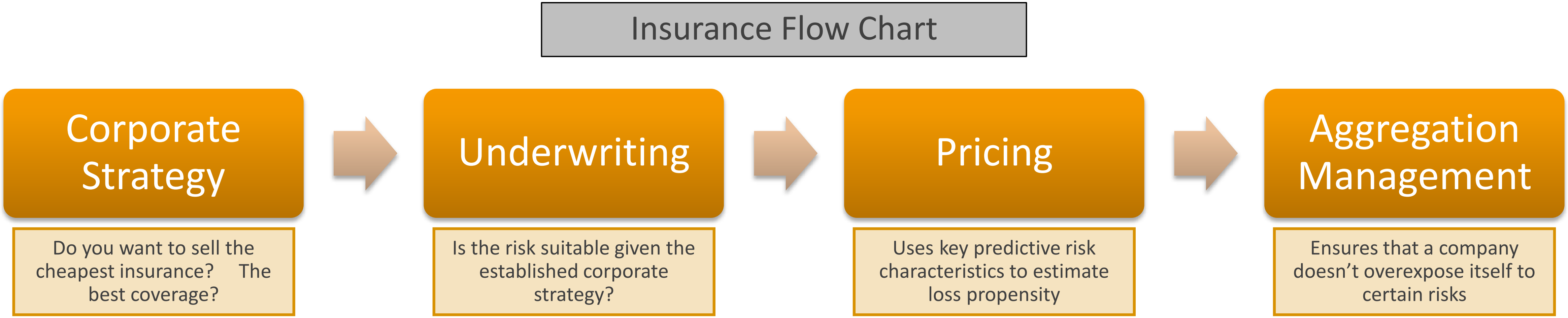
SOURCE: UK Government / Marsh Global Cyber Insurance Report (March 2016); IBIS World (2014); press reports; Allianz (2015); expert interviews

The explosion of IoT is creating a need for a market

What Is At Risk?

- Individual
  - Savings
  - Safety (e.g. compromised car)
  - Reputation (i.e. identity theft)
- Enterprise
  - Assets (e.g. intellectual property, customers list/records, money, physical assets)
  - On-going operations (e.g. website down for e-commerce, ransomware)
  - Reputation
  - Employees’ safety
- Insurance Industry
  - Inability to properly assess/quantify cyber risk
  - Solvency (i.e. individual companies/industry)

Challenges to Writing Cyber Insurance



Insurance Flow Chart

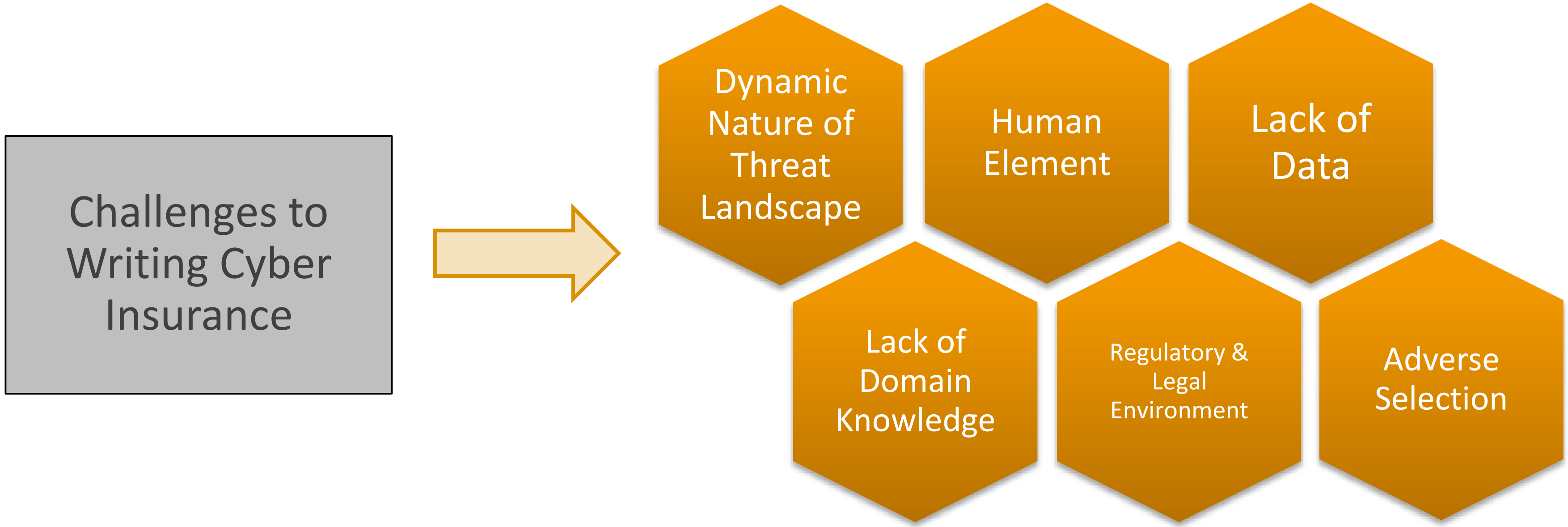
Corporate Strategy → Underwriting → Pricing → Aggregation Management

Corporate Strategy: Do you want to sell the cheapest insurance? The best coverage?

Underwriting: Is the risk suitable given the established corporate strategy?

Pricing: Uses key predictive risk characteristics to estimate loss propensity

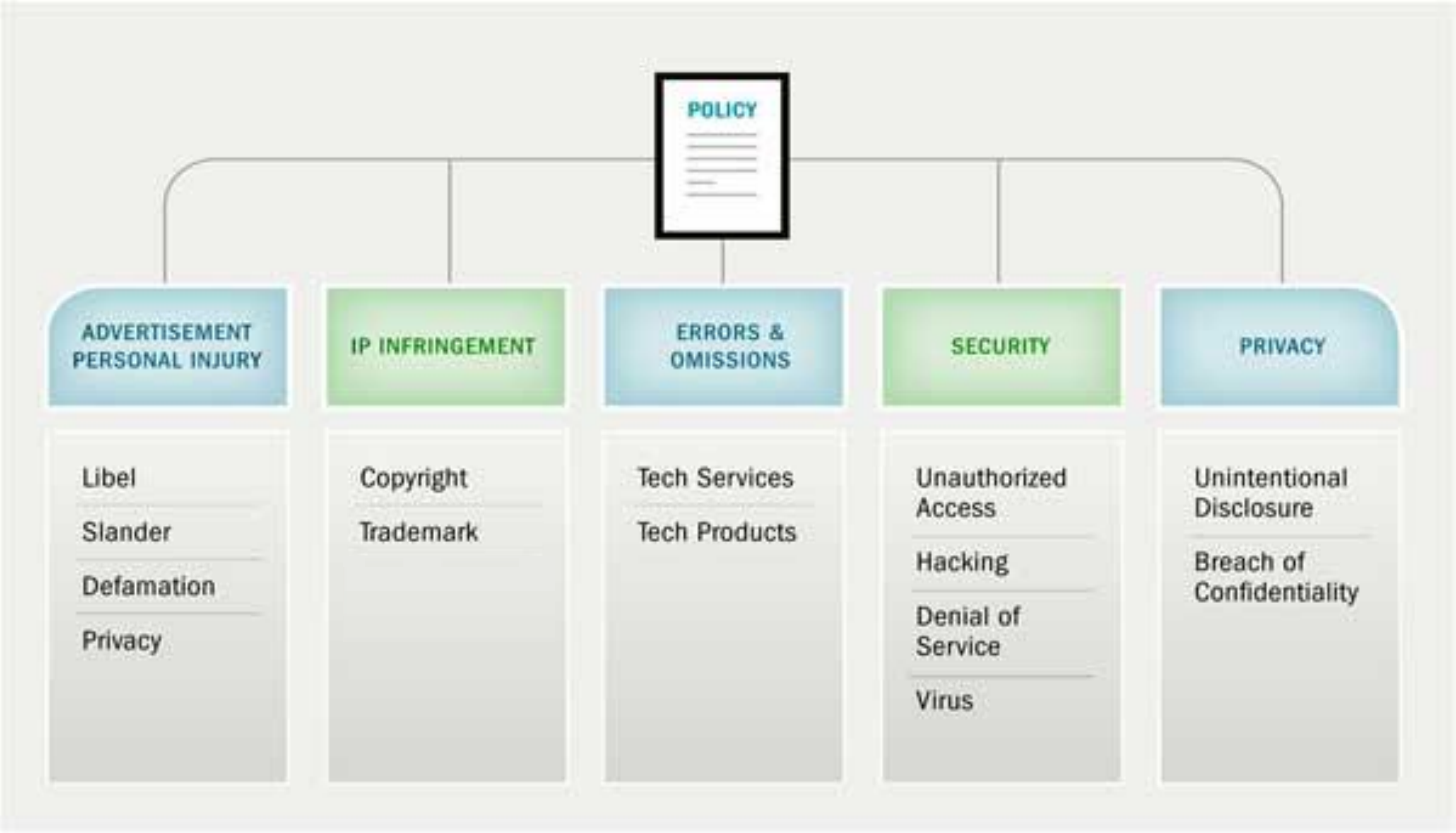
Aggregation Management: Ensures that a company doesn't overexpose itself to certain risks



Challenges to Writing Cyber Insurance →

- Dynamic Nature of Threat Landscape
- Human Element
- Lack of Data
- Lack of Domain Knowledge
- Regulatory & Legal Environment
- Adverse Selection

What does Cyber Insurance Cover?



POLICY

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Libel Slander Defamation Privacy	Copyright Trademark	Tech Services Tech Products	Unauthorized Access Hacking Denial of Service Virus	Unintentional Disclosure Breach of Confidentiality

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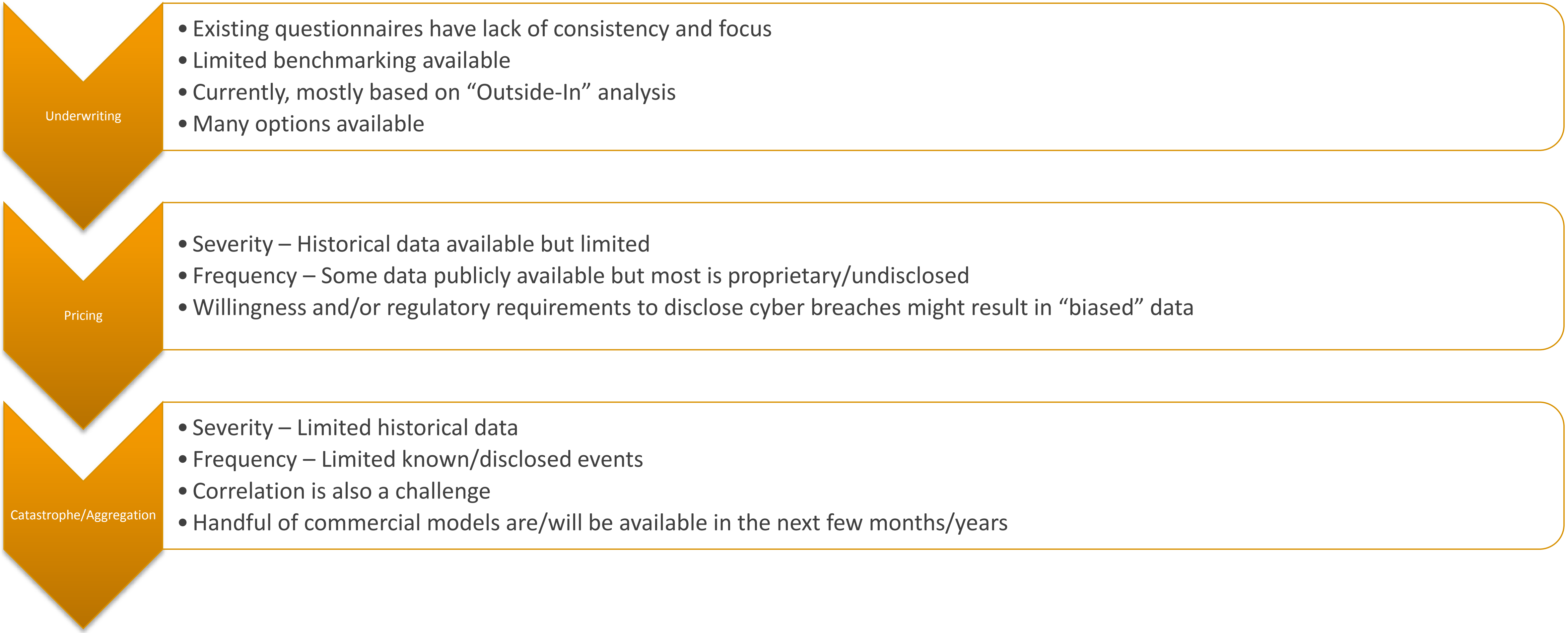
Tools and Models – Similar to other types of insurance



Underwriting

- Existing questionnaires have lack of consistency and focus
- Limited benchmarking available
- Currently, mostly based on “Outside-In” analysis
- Many options available

Pricing

- Severity – Historical data available but limited
- Frequency – Some data publicly available but most is proprietary/undisclosed
- Willingness and/or regulatory requirements to disclose cyber breaches might result in “biased” data

Catastrophe/Aggregation

- Severity – Limited historical data
- Frequency – Limited known/disclosed events
- Correlation is also a challenge
- Handful of commercial models are/will be available in the next few months/years

Tools and Models – Underwriting

Questionnaire

- Should focus on quality over quantity
- Need for monitoring: Good risk one day, good risk everyday … not the case!

“Outside-In” analysis

- Security posture based on publicly available information
- Provides good information but accuracy is not unanimous (and focus is not given to physical security)
- “Inside-out” provides valuable information

Availability

- Multiple options available for tools based on “outside-in” analysis
- Work being done to include “inside-out” and benchmarking

Tools and Models – Pricing

Demographics

- Industry
- Size (e.g. employee count, # end-point devices, # financial transactions)
- Location(s)
- Public or private

Financials

- Revenue
- Surplus / Equity
- “Asset value” at risk (e.g. # of PHI, PII, PCI records stored)

Security Posture / Technology

- Categories of software used
- Encryption practices
- User behavior (e.g. downloads, websites visited)

Tools and Models – Aggregation/Catastrophe

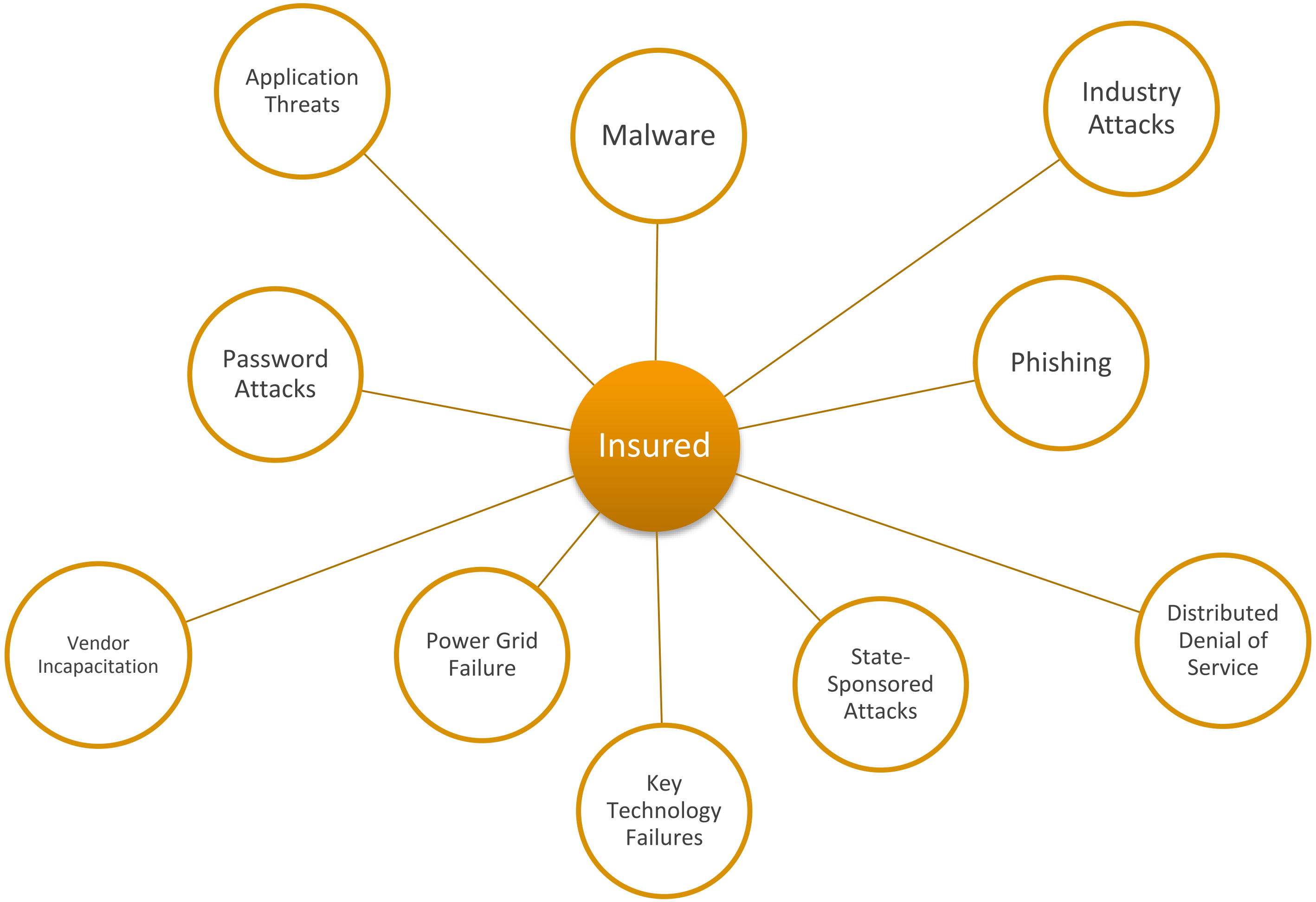
- Definition of “catastrophe”
- Risk identification is a challenge (i.e. what could go wrong?)
- Impact on portfolio (i.e. quantification)
  - Deterministic – How bad can it get?
  - Stochastic – Where’s the data?
- Understand exposure
  - “Stand-alone” cyber policies
  - Terms and conditions in non-cyber policies

Which coverages are triggered? Lack of standardization clouds the issue.

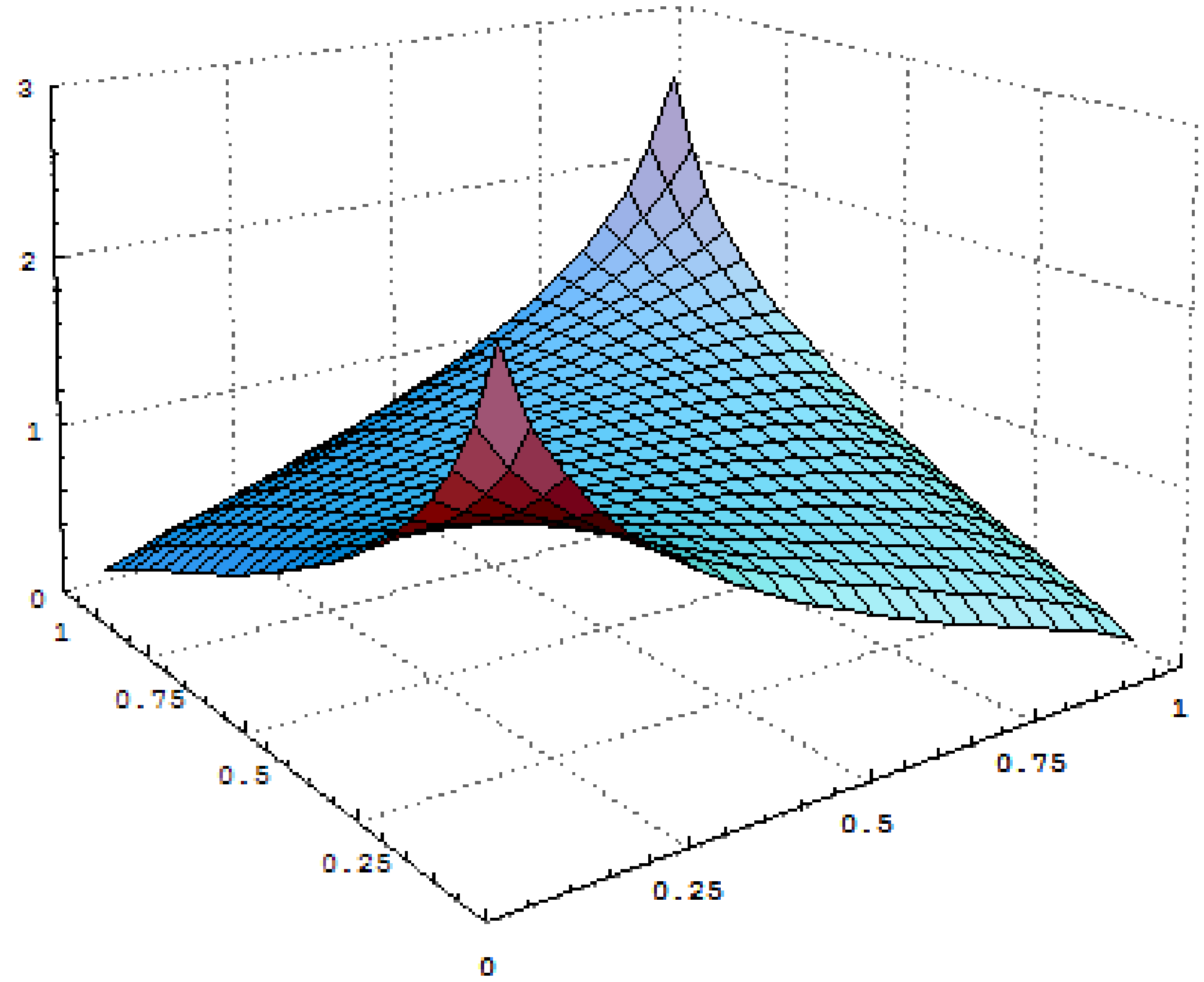
What about silent coverage?

	Property & Casualty									Life & Health	
Event	Affirmative Cyber	Property	Auto	Workers Compensation	Directors & Officers	Errors & Omissions	Business Owners	General Liability	Marine	Life	Accident & Health
Attack Scenario 1	x	x		x			x	x		x	x
Attack Scenario 2	x		x	x				x		x	x
Attack Scenario 3	x						x	x		x	x
Attack Scenario 4	x						x	x			
Attack Scenario 5	x						x	x			
Attack Scenario 6	x						x	x			
Attack Scenario 7	x						x	x			
Attack Scenario 8	x						x	x			

Insureds Must Protect Against a Diverse Range of Attacks



Events may very well be correlated



We need data! How does regulation come into play?

Regulation to be aware of:

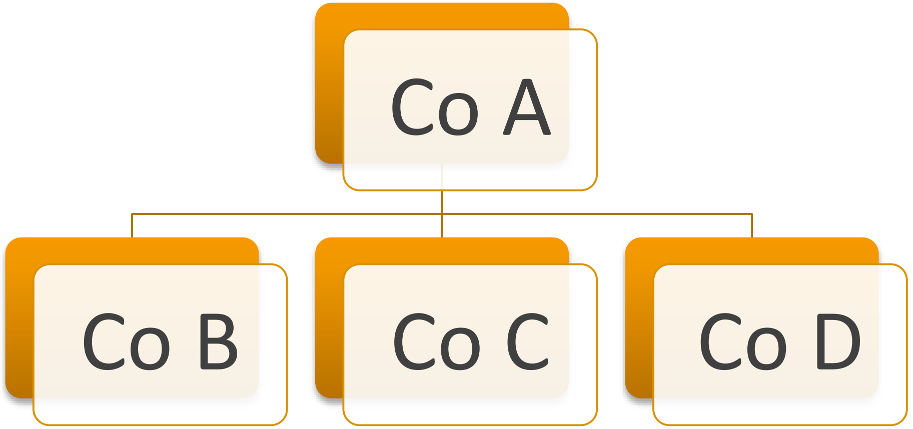
- EUGDPR regulation
- Insurance brokerage regulations (vs. marketing partnerships)
- Consumer regulation
- State vs. Federal Regulation

What is regulated?

- Pricing/Rating Variables
- Solvency
- Profit & Contingencies
- Breach Reporting Requirements

How we should define a catastrophe/aggregation event is unclear

VS.



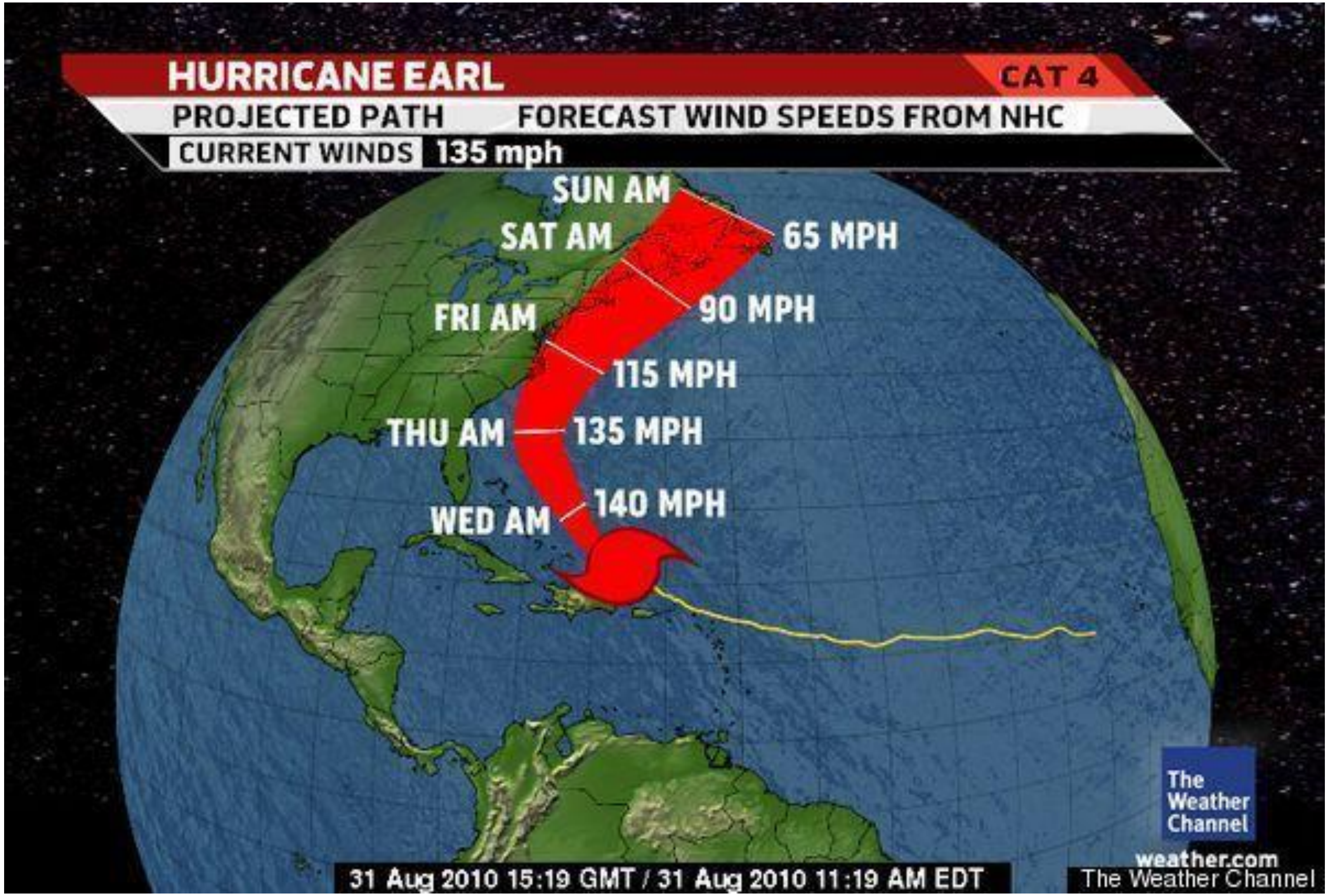
Co A

Co B

Co C

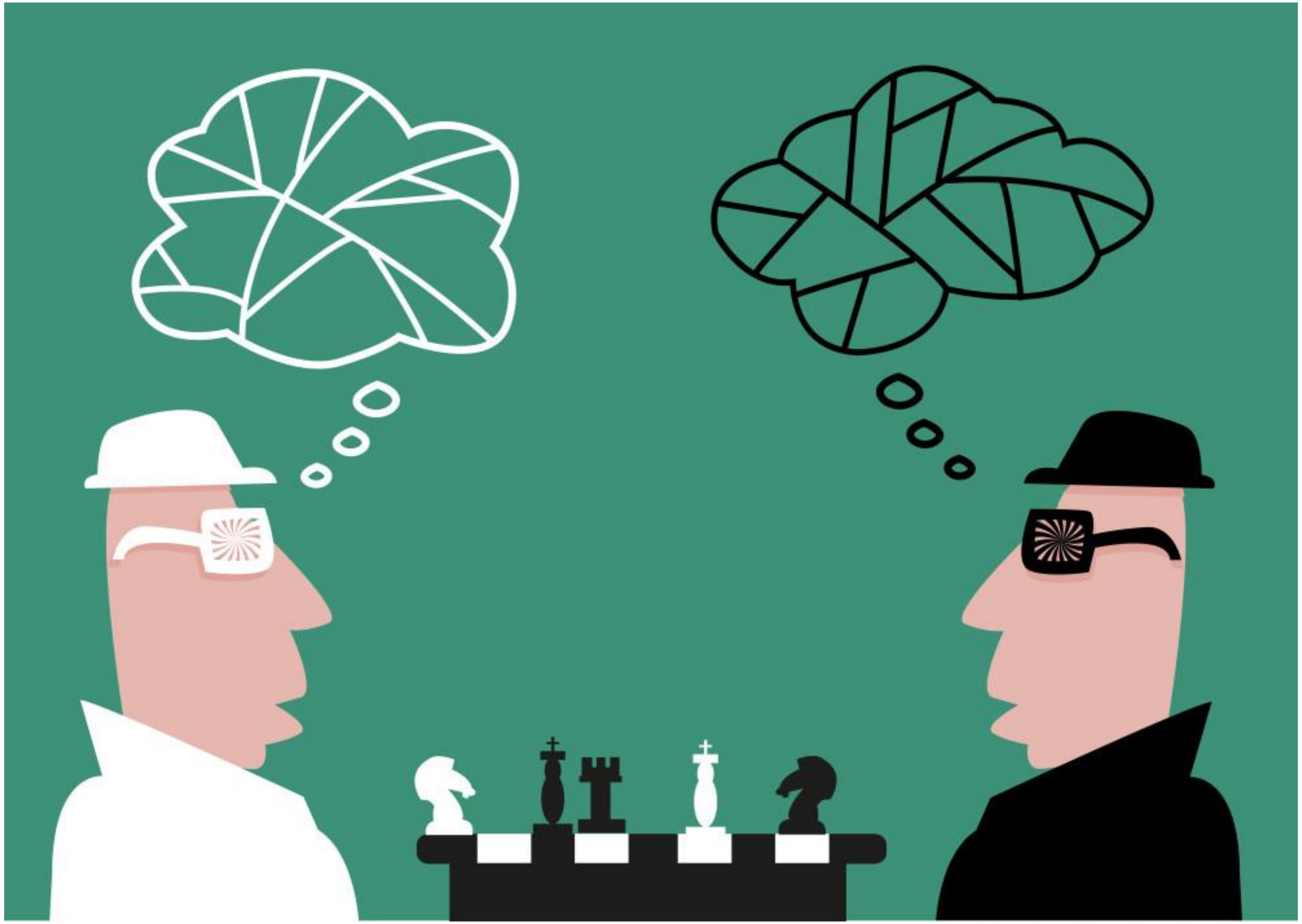
Co D

Traditional view of geography as a predictive variable

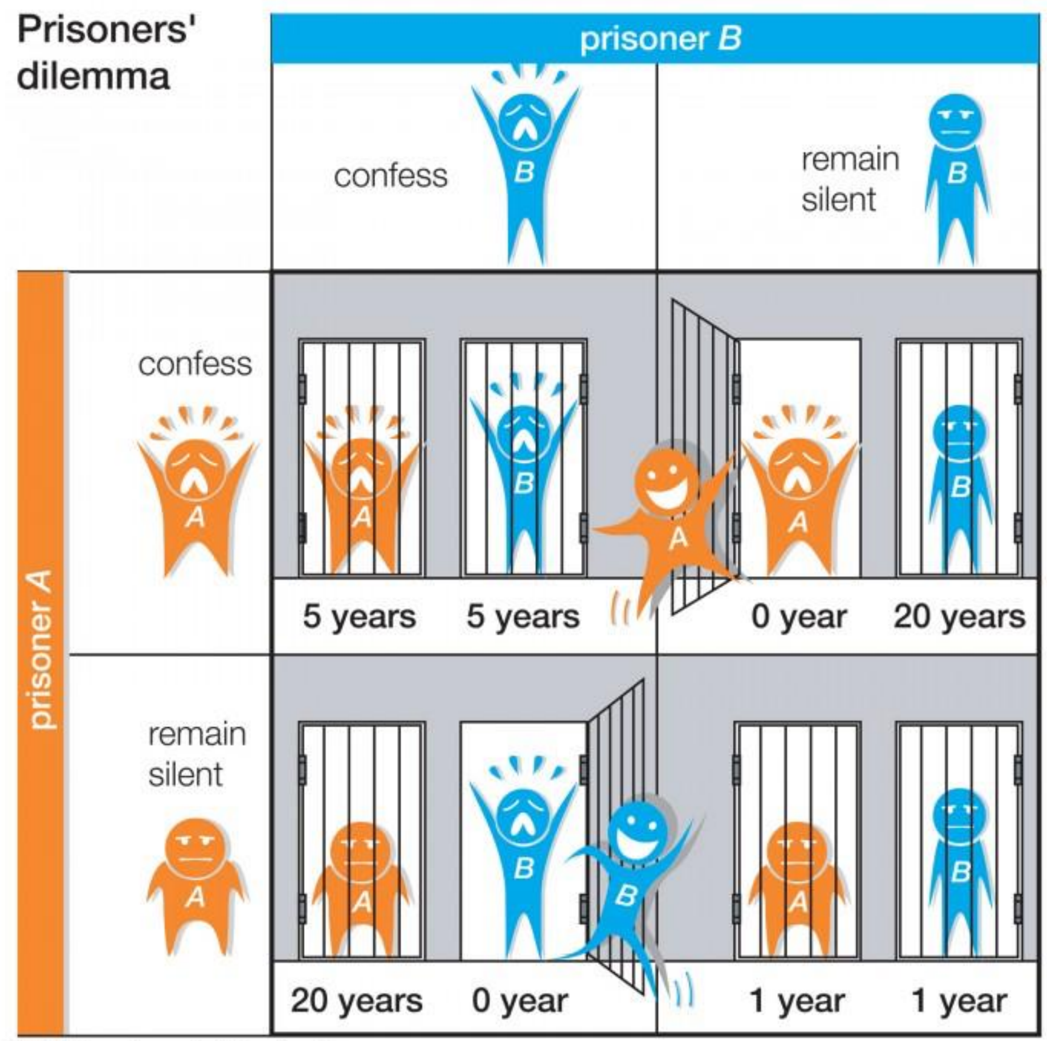


In a connected world, “geography” now takes on a new form…

Cyber Insurance contains a human element



What is Game Theory?



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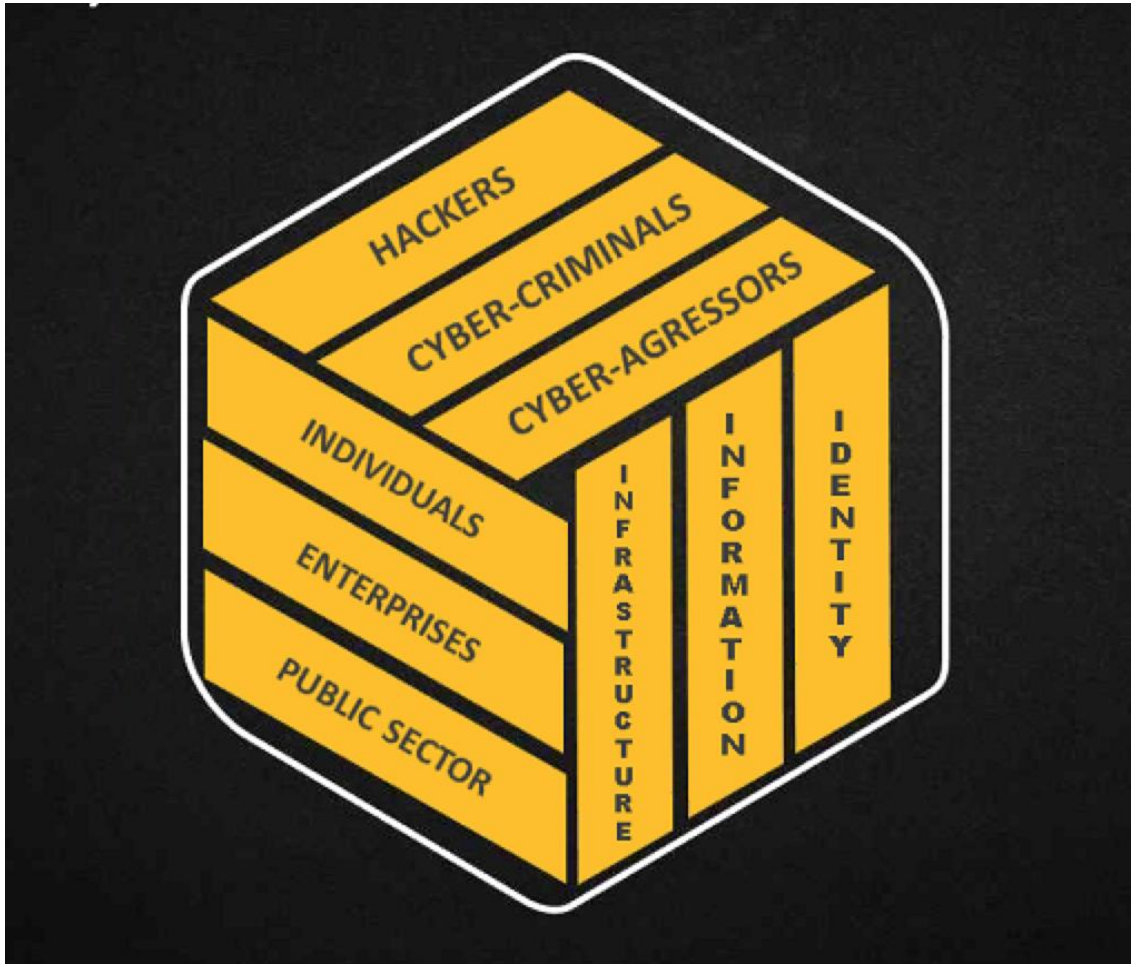
Cube Taxonomy Framework

Attackers

Targets

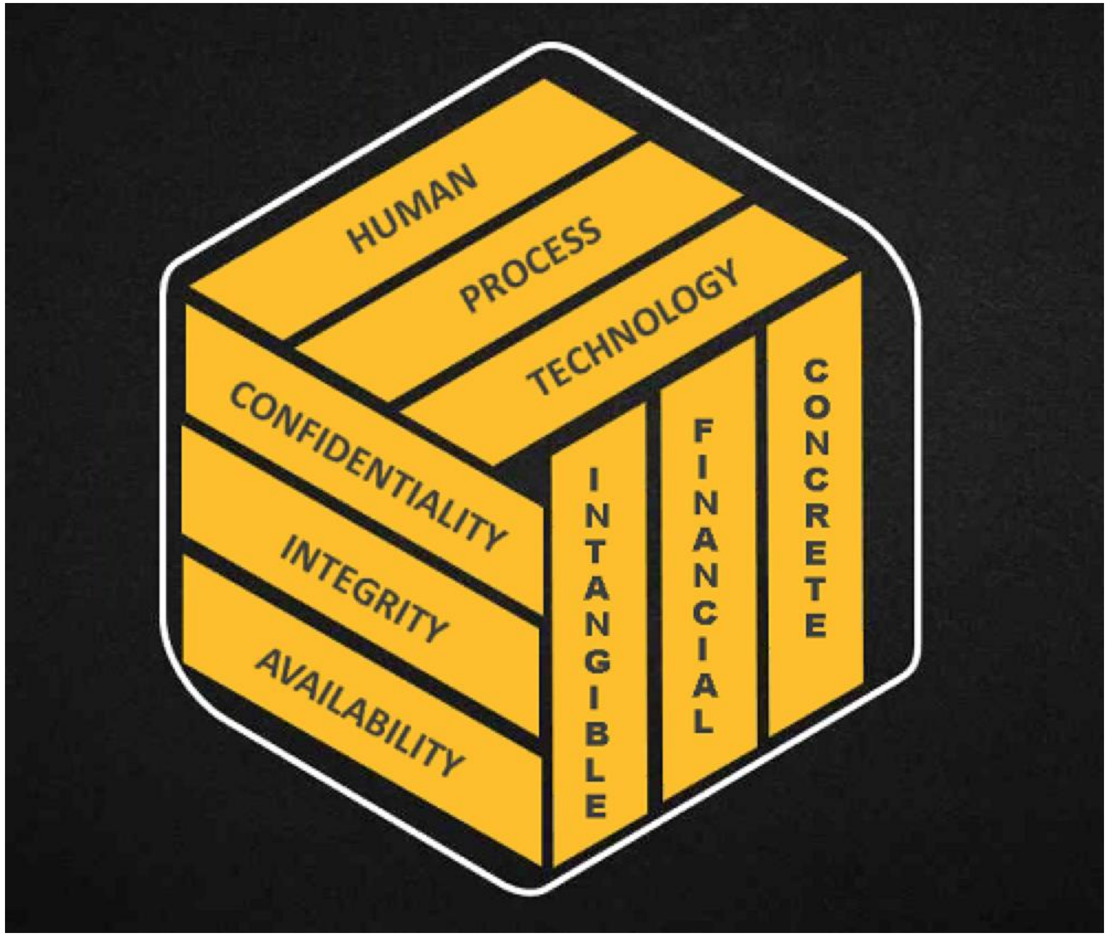
Objectives



Cube Taxonomy Framework (Continued)

Vulnerability

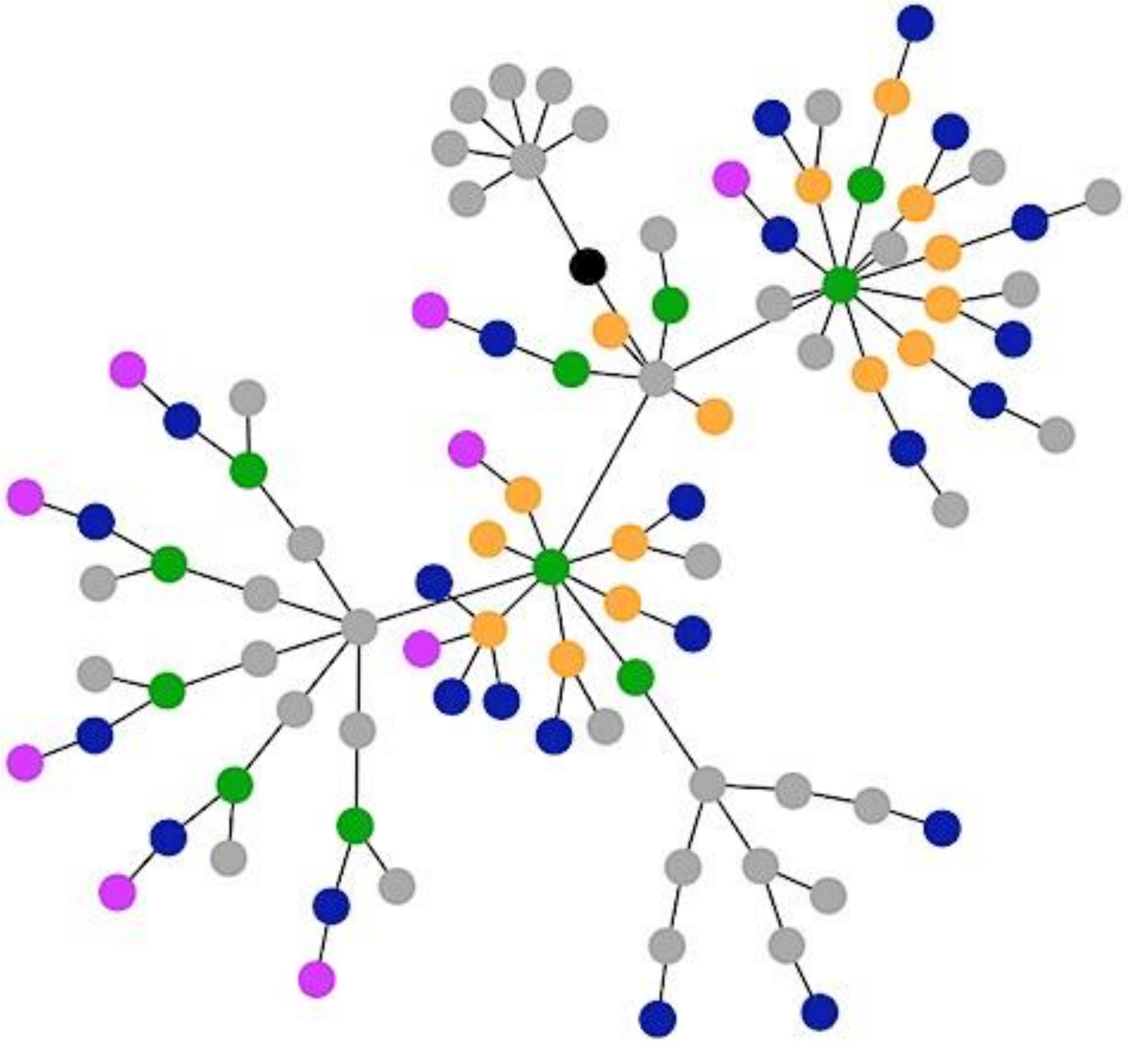
Impact



Consequences

What is your security posture?

An insurer must pay attention to insured relationships



Consumer cyber insurance – open questions in a new market

Example consumer coverage

- Phishing fraud
- Online reputation repair
- Virus removal
- Theft of devices
- Counseling for online bullying/abduction
- Identity theft

Questions being asked by insurers

- Are consumers sufficiently covered by existing policies/endorsements?
- Is there a market for more comprehensive standalone policies that bundle these together?
- What are the barriers to these policies?
- Is there a role for services provision within these policies?

Micro-business cyber insurance – open questions in a new market

Scope

- Single person owner-operators?
- 1-10 person small businesses without IT staff?

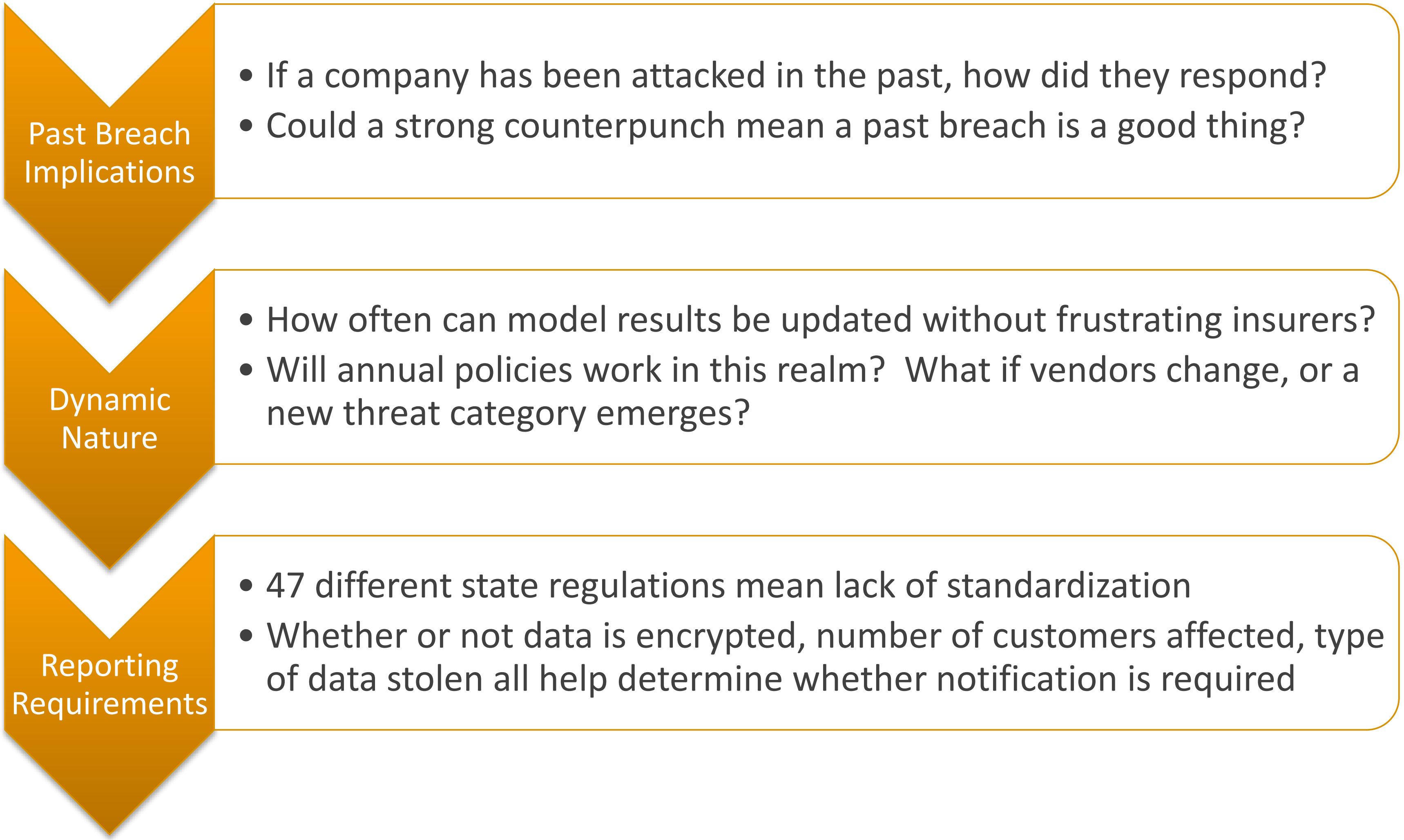
Coverage

- Data privacy policies? (incident response, breach notification, third party liability)
- Business interruption? (lost revenue)

Questions being asked by insurers

- Are small businesses sufficiently covered under existing business policies (e.g., “business owners policies”, policy endorsements)?
- Is there a market for standalone micro-business policies? If so, how should distribution for these policies work (presumably broker channel is cost prohibitive)?
- Operationally, how do mid-market policies need to be adapted for these micro-businesses (e.g., any underwriting, claims triage, incident response)?

Other Challenges and Considerations



Past Breach Implications

- If a company has been attacked in the past, how did they respond?
- Could a strong counterpunch mean a past breach is a good thing?

Dynamic Nature

- How often can model results be updated without frustrating insurers?
- Will annual policies work in this realm? What if vendors change, or a new threat category emerges?

Reporting Requirements

- 47 different state regulations mean lack of standardization
- Whether or not data is encrypted, number of customers affected, type of data stolen all help determine whether notification is required

Thank you!

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