RSAConference2019
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Do You Know Your Organization's Top 10 Security Risks?

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360,950
DLP events monitored

13,600,000
# of Mobile Auths

14,300
# of Servers Monitored

16,703
Inbound Emails blocked

570+
Shadow IT Cloud

8,450,00
# of Outbound Emails

16,709
of .exe blocked from downloa

1200
Actively Managed
3rd Party Vendors

19,200,000,000
# of Proxy Transactions

3,000,000
# of Web Auths

What does the data tell you about your organization's Top Security Risks?

Agenda

Aetna's custom approach

- 5 Steps to identifying/determining Top 10 security risks
- Key factors to success and metrics
- Steps to kick off a similar program in your organization

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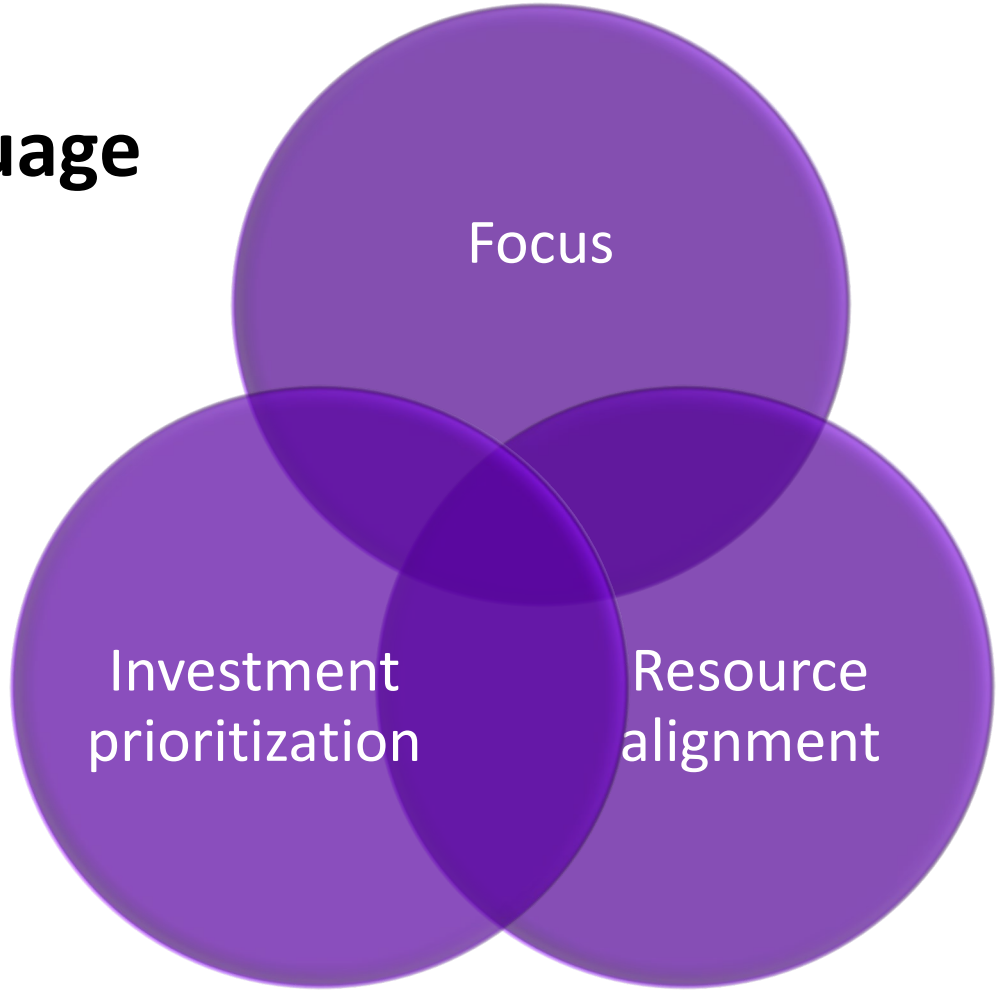
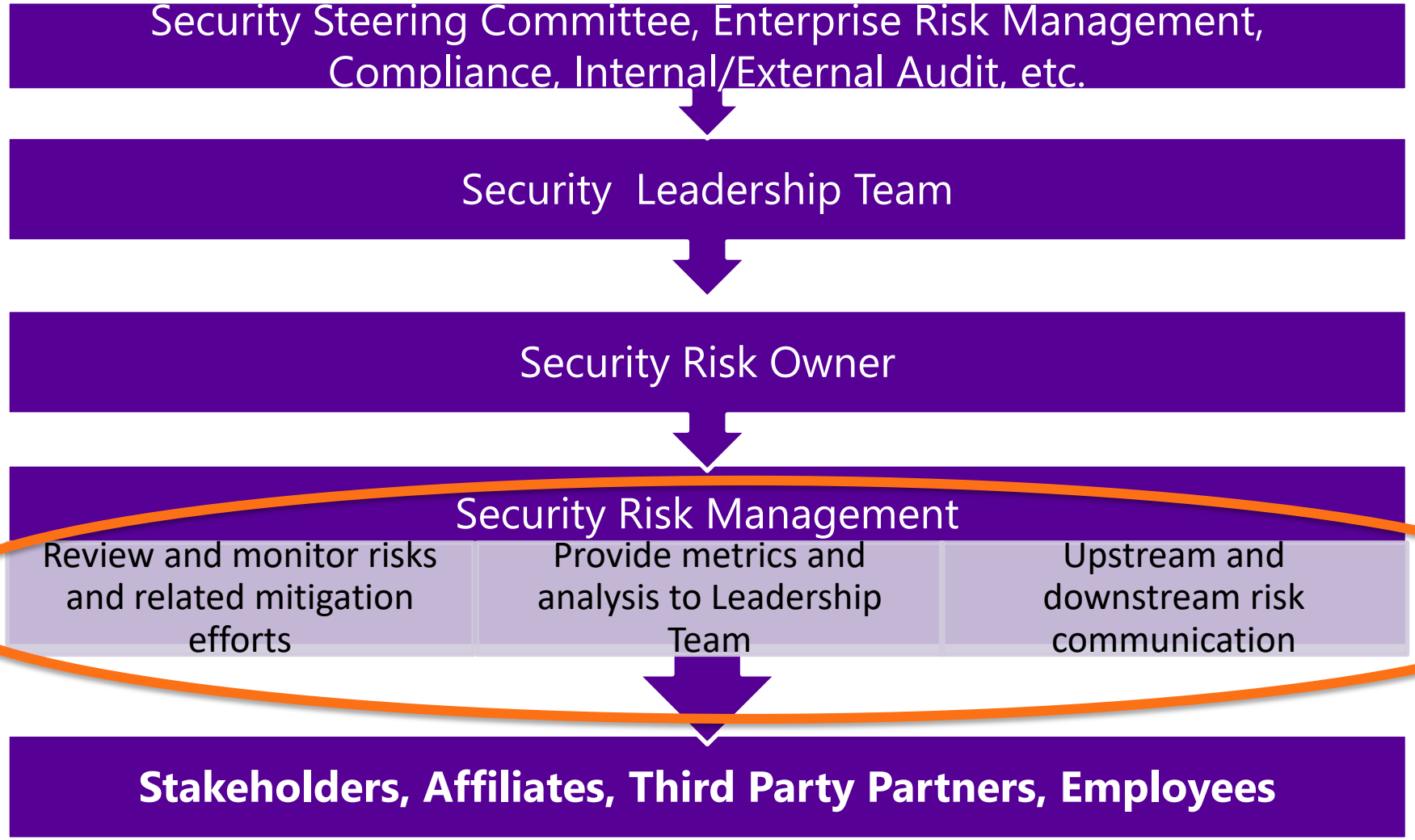
5 Steps to Identifying/Determining Top 10 Security Risks

5 Steps to Top 10 Security Risks

1. Establish a **governance process**
2. Define a **common security risk language**
3. Identify **risk input**
4. Transform **risk input**
5. **Prioritization**



1. Governance



Dedicated resources for governance

Consistency is the key

Establish a governance workflow

2. Common security risk language – security risk categories

Driven by Security framework(s)

- Frameworks (see Appendix A)
  - NIST 800–53 (Government)
  - COBIT (General)
  - ISO 27001 (Certificate)

Security Risk Categories

=

Family of control standards

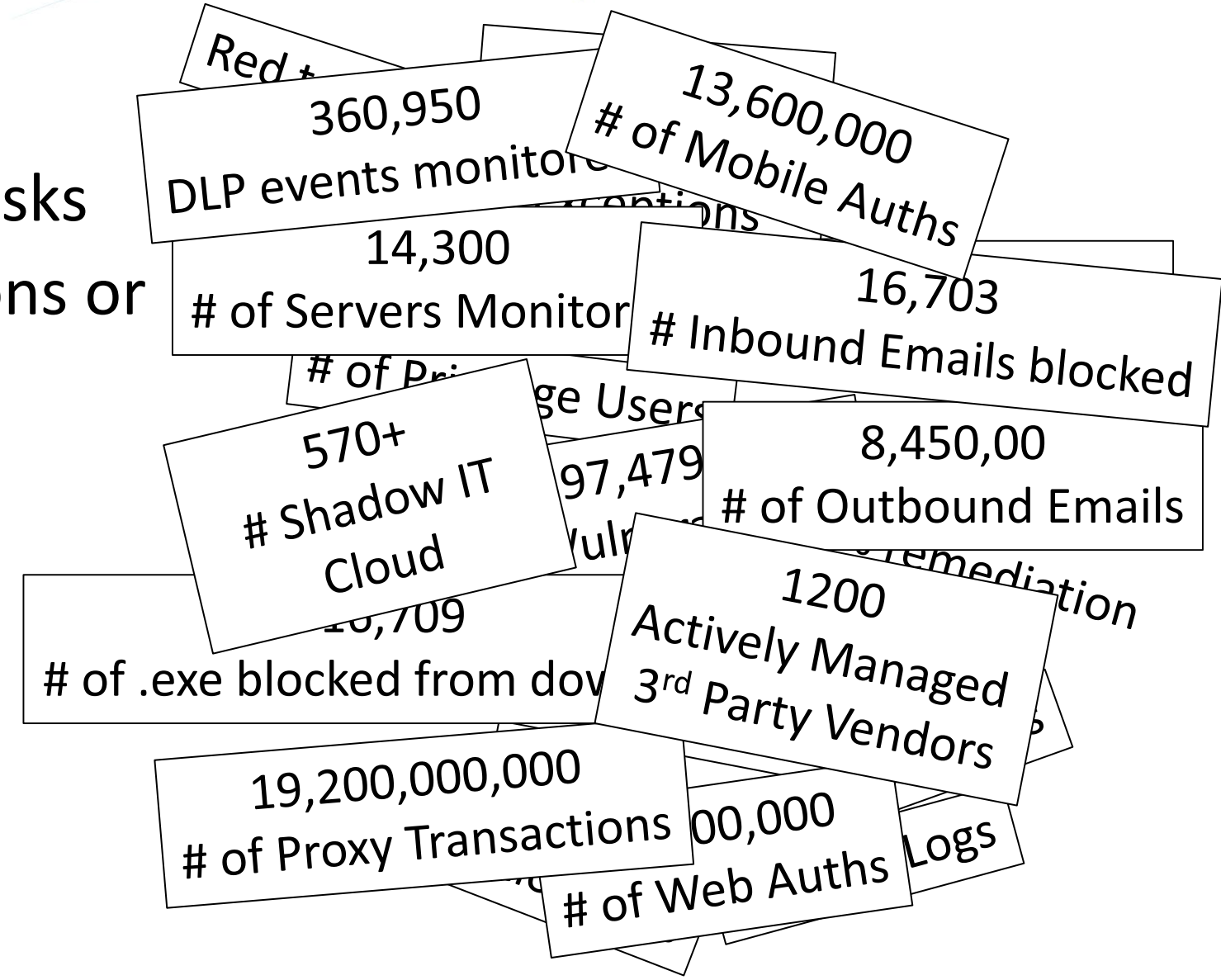
2. Common security risk language – risk categories

Aetna risk categories			
Access Management	Data Protection Management	Network & Communications Security	Security Intelligence
Audit and Accountability	Endpoint Protection	Personnel Security	Security Management
Business Continuity Management	Event, Incident, & Problem Management	Physical Security	Security Operations
Crisis Management	IT Hygiene	Risk Management	Software Security

16 high-level categories, 30 sub-categories – See Appendix B

3. Risk input

- Indicators of Security Risks
- Risk Management Actions or Controls Activities
- External Trends



3. Risk input –your company's indicators of risks

Daily TVA – See Appendix E

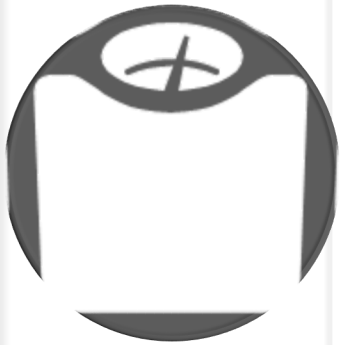
Incidents

Exceptions
Open/Expired

Remediation
Plans
Open/Expired

External
Trends

Key
Controls
Testing
Failures



KPIs
500+

Risk indicators currently at Aetna

3. Risk input– your company's control activities

Control Standard

600+

Exceptions – Closed

Remediation Plans – Closed

KPIs

500+

Analytic Models

300+

Control activities currently at Aetna

4. Transforming risk input - why and how?

Risk data are facts, numbers, evidence

Risk data trended and interpreted is risk information

Risk information + insight/experience = risk knowledge

(See Appendix A on Knowledge Management)

4. Transforming risk input – how? (see Appendix A)

Sources of risk input
Incidents
Key Controls Testing failure
Open/Expired/Closed Exceptions
Open/Expired/Closed Remediation Plans
# of Control Standards
# of KPIs
Data Analytics Models

Aetna - risk categories			
Access Mgmt.	**Data Protection Mgmt.**	**Network & Comm. Security**	**Security Intelligence**
Audit and Accountability	Endpoint Protection	Personnel Security	Security Mgmt.
Business Continuity Mgmt.	**Event, Incident, & Problem Mgmt.**	Physical Security	Security Operations
Crisis Mgmt.	IT Hygiene	Risk Mgmt.	Software Security

4. Transforming risk input – example

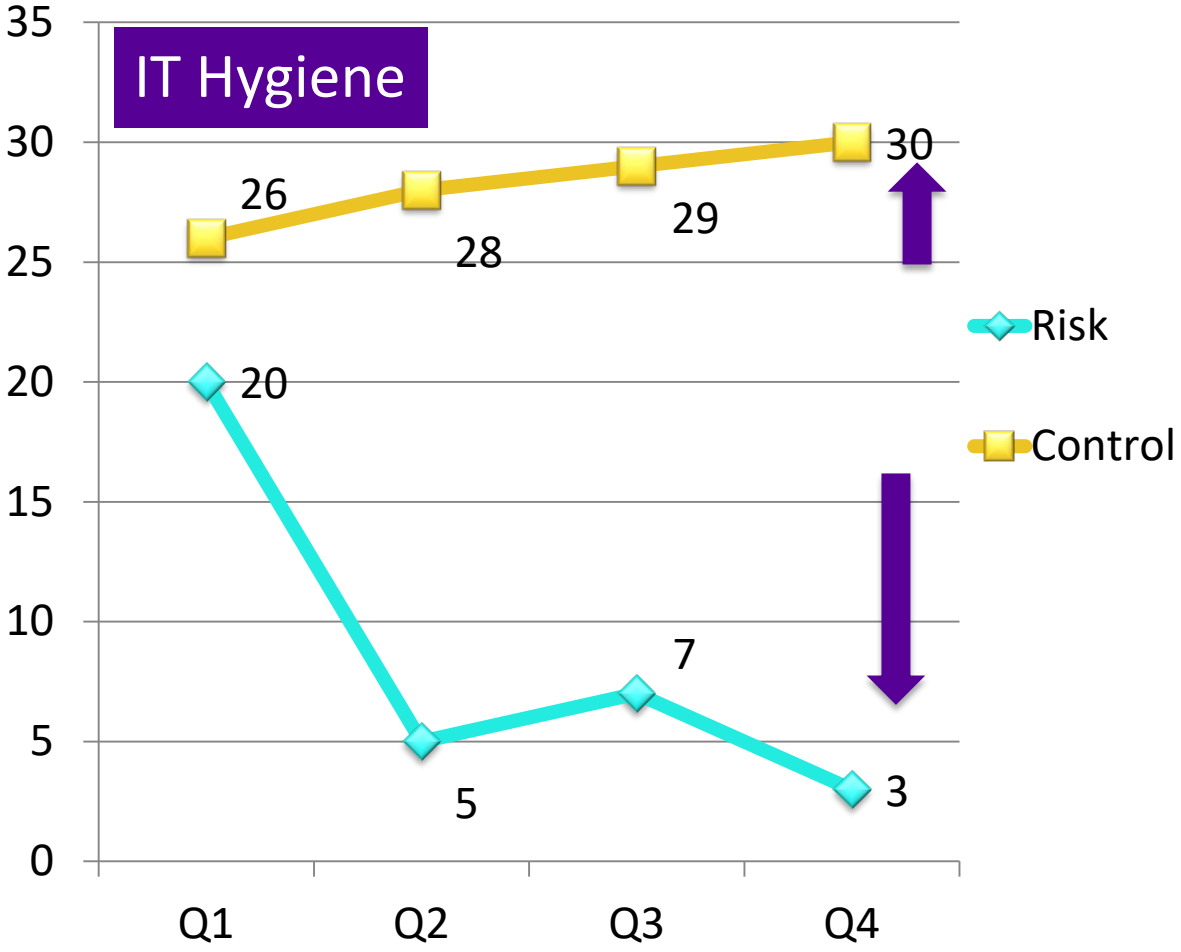
Illustrative Only

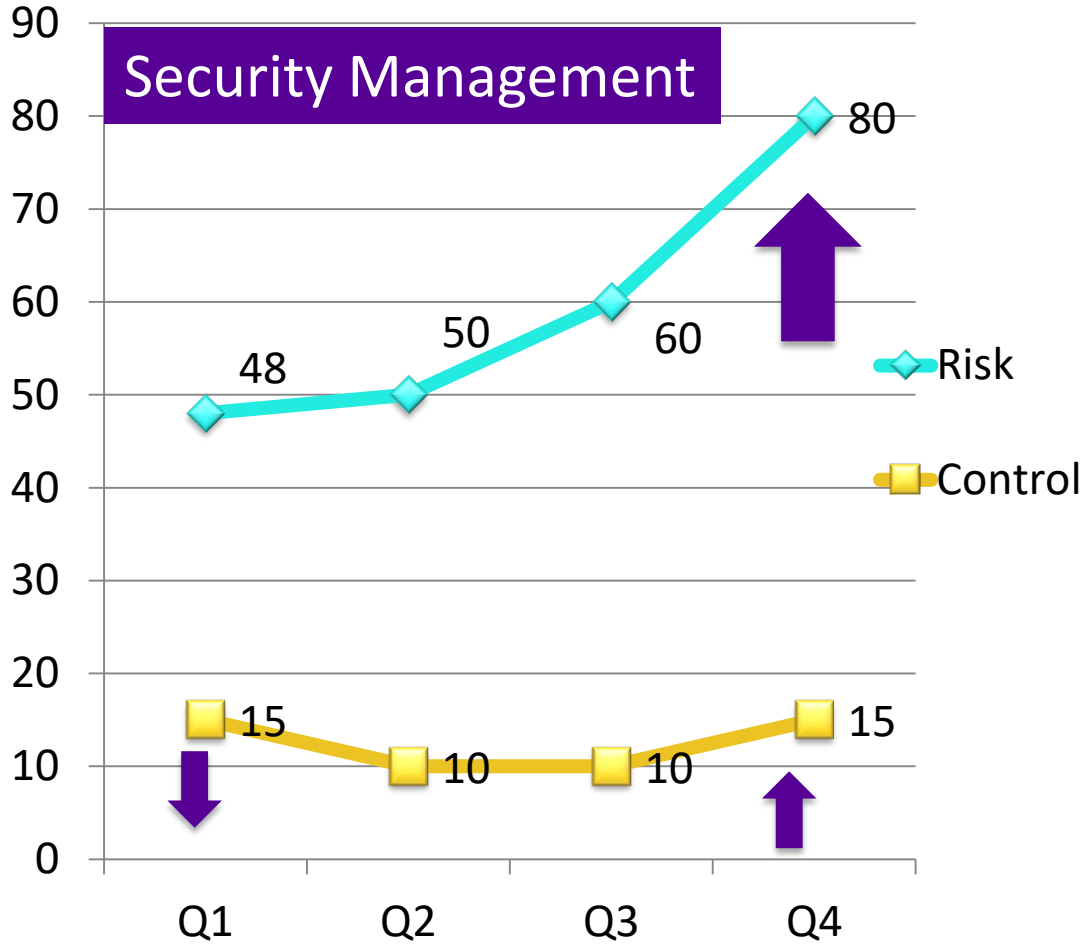
Q1 Risk Input	Security Risk Category: Access Mgmt.	Data Protection Mgmt.	IT Hygiene	Network and Comm. Security	Security Mgmt.
Incidents	5	3	**7**	1	**25**
Key Controls Testing Failures	0	0	**3**	1	**8**
Open/Expired Exceptions	10	20	**1**	1	**5**
Open/Expired Remediation plans	5	15	**4**	0	**10**
# of Control Standards	1	4	**2**	3	**0**
# of KPIs	4	3	**2**	3	**0**
Closed Exceptions	5	15	**3**	5	**10**
Closed Remediation Plan	10	2	**20**	2	**5**
Data Analytics Models	5	5	**1**	1	**0**
Projects Closed	1	1	**2**	0	**0**

4. Transforming risk input

Illustrative Only

Hypothesis and deeper dive





5. Prioritization (see Appendix C)

Impact	
Critical (5)	>$10M loss;>10% market share loss
	Loss of executive life
	Severe impact on reputation/brand/member
	Severe/catastrophic harm to individuals
	Severe degradation operational performance.
	>7.5% of member accounts affected.
High (4)	$5M - $10M loss; 7-10% market share loss
	Significant impact on reputation/brand/member
	Long-term negative media coverage
	Severe/catastrophic harm to individuals
	Severe degradation in mission capability
	5% of member accounts affected
Medium (3)	$1M - $5M loss
	Some impact on reputation/brand/member
	National short-term negative media coverage
	Significant harm to individuals
	Significant degradation in mission
	2.5% of overall member accounts affected
Low (2)	$500k - $1M loss
	Limited impact on reputation/brand/member.
	Minor harm to individuals.
	Limited impact on operations
	1-2.5% of all member accounts affected
Very Low (1)	<$500k financial loss
	No reputational/brand/member damage
	Negligible adverse effect on operations
	<1% of all member accounts affected

Likelihood	
Almost Certain (5)	> 75% chance of occurring
	Sophisticated adversary almost certain to initiate.
	Error, accident > 49 times a year
Probable (4)	50-75% chance of occurring
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	Error, accident 1-2 times a year

Control Effectiveness	
Mostly Ineffective (1)	< 10% of the population
Rarely Effective (0.8)	10-20% of the population
Ocasionally Effective (0.6)	21-50% of the population
Mostly Effective (0.4)	51-75% of the population
Highly Effective (0.2)	75% of the population

Priority Risk Score :

(((Impact + Likelihood)/2)* Control Effectiveness)

5. Prioritization example

Illustrative Only

Risk Category	Q4 Risk	Q4 Control Effectiveness	Q4 Residual Risk
Access Management	3	0.4	1.2
Data Protection Management	3	0.6	1.8*
IT Hygiene	4	0.4	1.6*
Network and Communications Security	3	0.2	0.6
Security Management	4	0.6	2.4*

5. Security risks example – Deeper dive

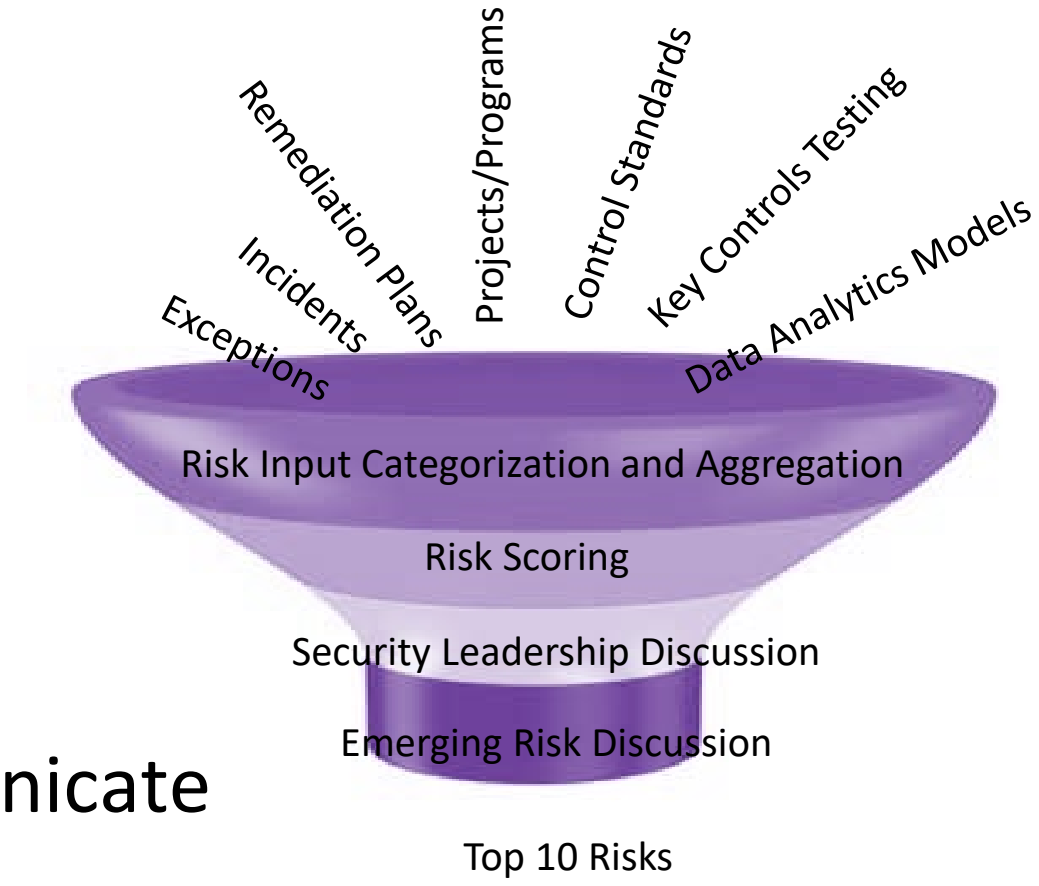
Illustrative Only

Security Risks	Q4 Risk	Q4 Risk Management	Q4 Residual Risk
Security Management – vendor/3rd party security governance	4	0.6	2.4
Data Protection – data protection program among vendors/3rd parties	3	0.6	1.8
IT Hygiene – asset integration from newly acquired company	4	0.4	1.6

Now Create

(See Appendix D)

- Quarterly Top 10 Security Risk Review Including
  - Top 10 security risks supported by
  - Aggregated data and trends with
  - Risk scoring for each Top 10 Risk, adding
  - Company insight + experience to
  - Prioritize top security risks, and
  - Emerging risk discussion
- Communicate, communicate, communicate



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Key Factors to Success and Metrics

Key Factors to Success

- Senior leadership buy-in
- Dedicated resources
- Consistent language of risk
- Educate, educate, educate
- Automate, automate, automate

Key Metrics

Existing

- # of risk inputs with embedded risk categories
- Risk score by Top Security Risks

Future - Formal and more granular

- Risk score by Security Risk Categories
- Emerging Risk Insight by Security Risk Categories

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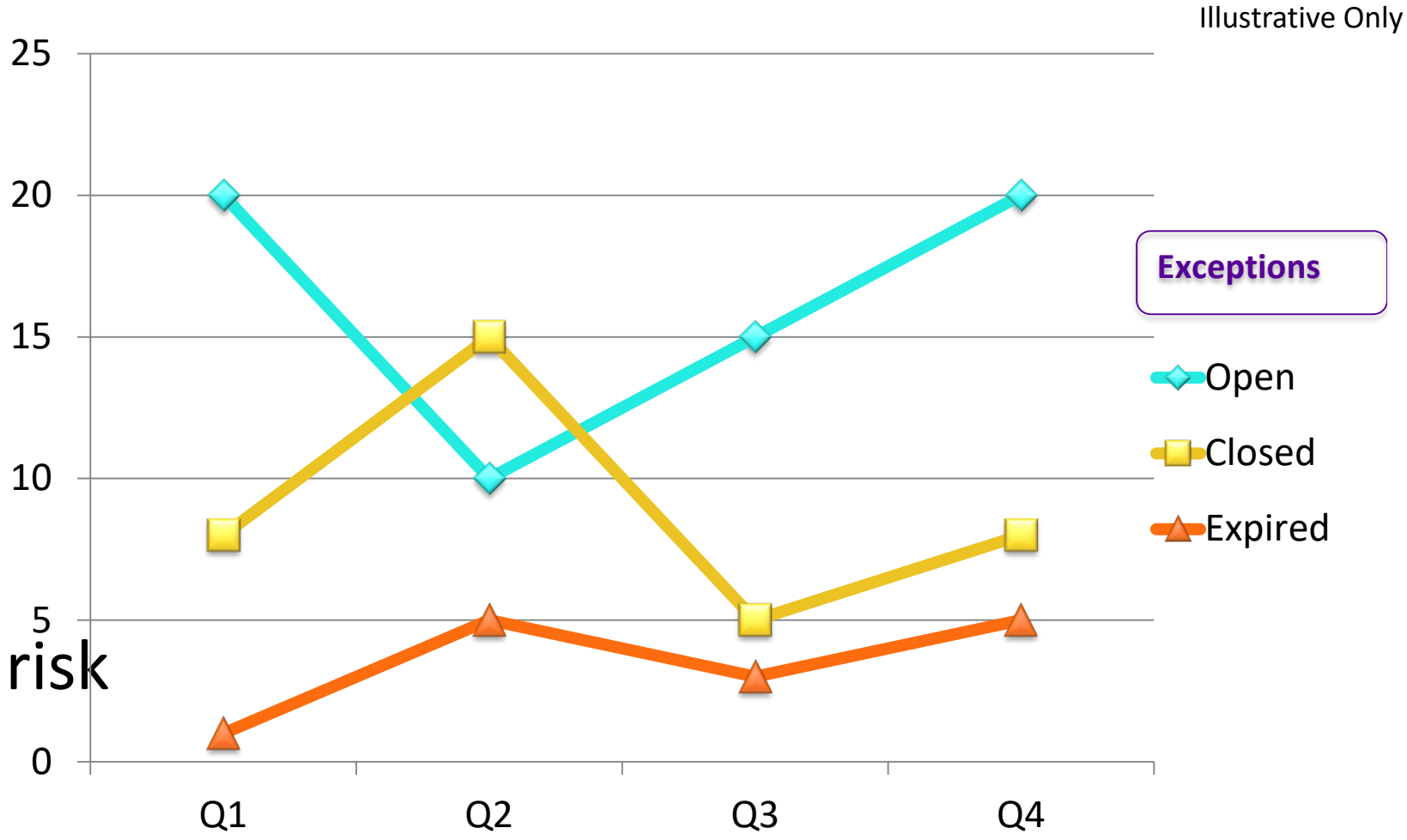
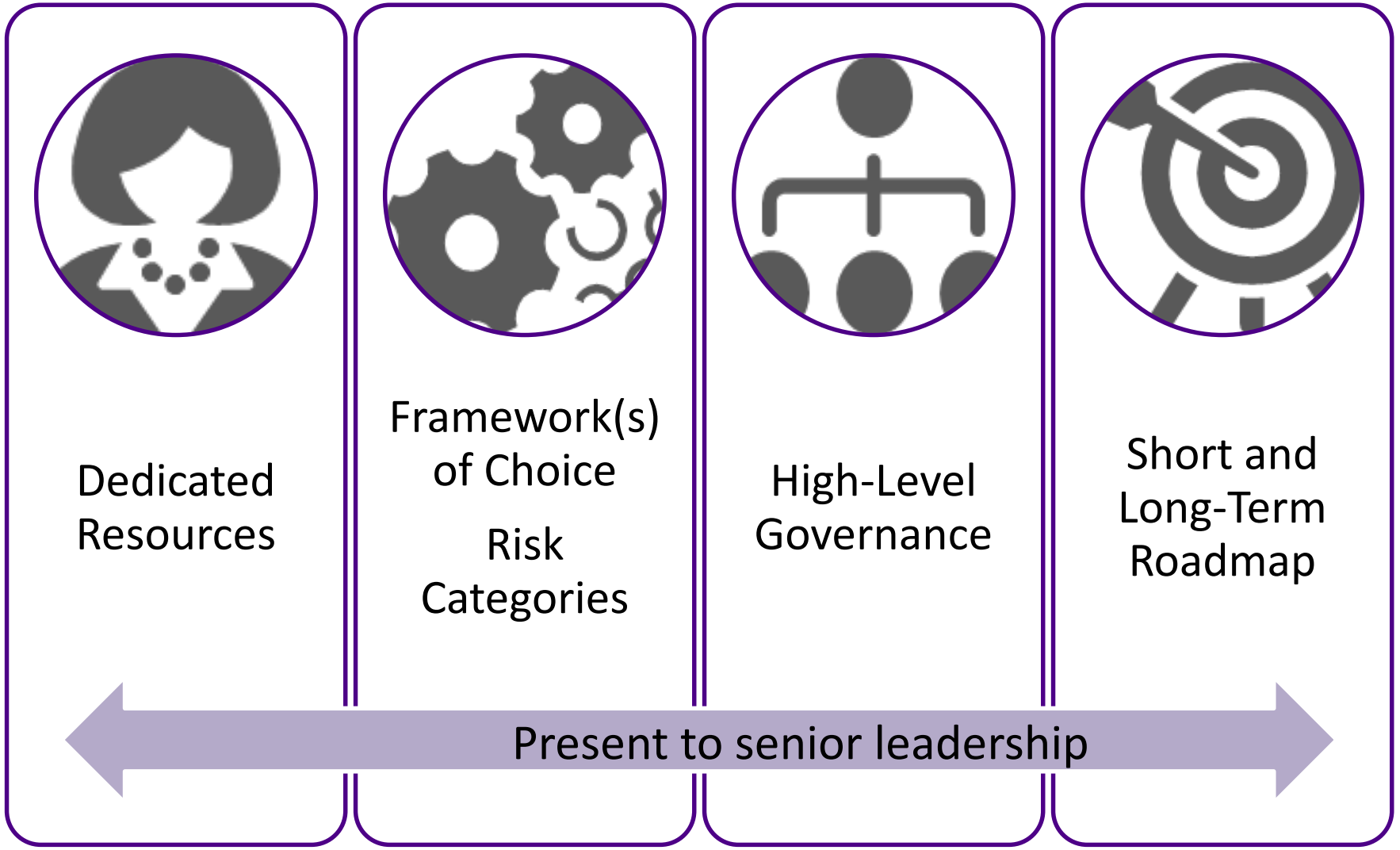
Steps to kick off a similar Program in your organization

Apply: Next Week – determine what you already have

- Input
  - Measurements
  - metrics or
  - Key Performance Indicators
- Risk Trends
- Reporting (risk and risk management)



Apply: First three months



Show progress – Buy-in

Apply: within six months

- Align risk categories to risk input (could lengthy)
- Educate, educate, educate
  - Owners of risk inputs
  - Contributors to risk input
- Report and determine improvement opportunities (e.g., automation)
- Repeat with the cycle

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CVSHealth

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Appendix A

Additional Resources

Resources

NIST 800-53

- https://csrc.nist.gov/publications/detail/sp/800-53/rev-4/final

COBIT 5

- https://www.isaca.org/COBIT/Pages/COBIT-5-Framework-product-page.aspx
- https://www.techrepublic.com/blog/it-security/cobit-5-for-information-security-the-underlying-principles/
- http://www.isaca.org/cobit/pages/info-sec.aspx

ISO 27001

- https://www.iso.org/isoiec-27001-information-security.html
- https://www.iso.org/obp/ui/#iso:std:iso-iec:27001:ed-2:v1:en

Resources

Knowledge Management

- https://searchdatamanagement.techtarget.com/feature/Defining-data-information-and-knowledge
- http://www.knowledge-management-tools.net/knowledge-information-data.html

Other good resources about Security Risk Management

- New York DFS Cybersecurity https://www.dfs.ny.gov/legal/regulations/adoptions/dfsrf500txt.pdf

Transforming risk input - example

Illustrative Only

Data ?

150,000 events seen in DLP daily
1,000,000,000 of transactions logged at Web Proxy daily
300 applications containing the crown jewels

Information ?

60% of DLP events pertain to Third Parties/Vendors
89% of applications with crown jewels have no security defects
3 websites of risk score 7 or higher are blocked in June

Knowledge ?

Increased third party vendor use of cloud
Active exchange of crown jewel data via email

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Appendix B

Aetna Security Risk Categories - Subcategories

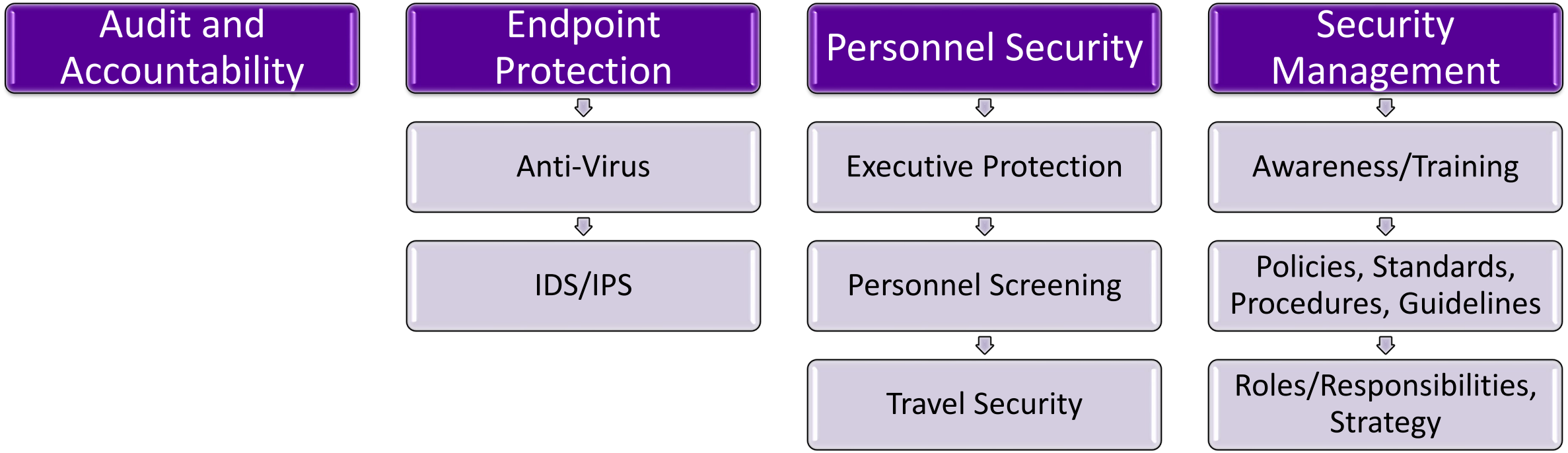
Common Risk Language - Security Risk Subcategories

- **Access Management**
  - Authentication
  - Authorization
  - Enrollment/Registration
  - Identification
  - Privileged Access Management
- **Data Protection Management**
  - Classification
  - DLP
  - Encryption
  - Media Handling
  - Ownership
- **Network and Communications Security**
  - Communications (e.g. email security)
  - Message Security
  - Network Security
- **Security Intelligence**

Risk Category definitions

Access Management	Authorization and authentication of personnel prior to granting them access to information resources.
Authentication	Verifying the identity of a user, process, or device, often as a prerequisite to allowing access to resources in an information system.
Authorization	Decision given to authorize a user, process, or device based on an agreed-upon set of security controls.
Enrollment / Registration	The enrollment process is based on a set of policies or is manually controlled by the owner of the resource.
Identification	Creation, management, and deletion of identities without regard to access or entitlements.
Privileged Access Management	The management of the processes to control/monitor a user that is authorized to perform security-relevant functions that ordinary users are not authorized to perform.

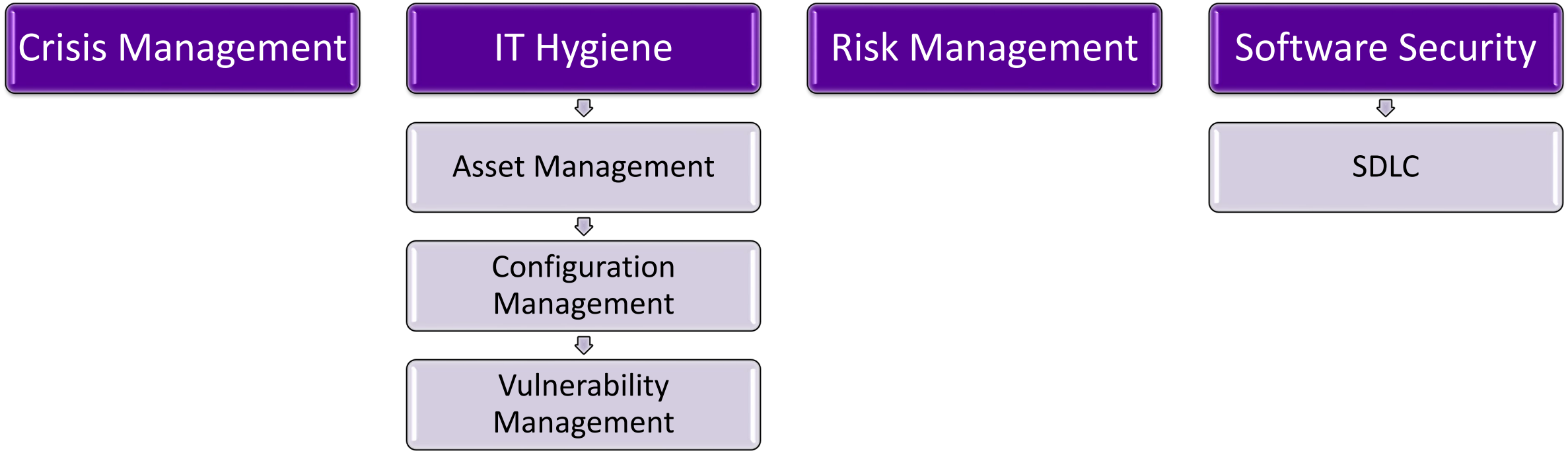
Common Risk Language – Security Risk Subcategories



Common Risk Language - Security Risk Subcategories

- Business Continuity Management
- Event, Incident,& Problem Management
- Physical Security
  - Environmental Systems
  - Facilities
  - Information Systems
- Security Operations
  - Monitoring

Common Risk Language - Security Risk Subcategories



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Appendix C

Risk Scoring

Risk Scoring References

- OWASP - https://www.owasp.org/index.php/OWASP_Risk_Rating_Methodology#Step_2:_Factors_for_Estimating_Likelihood
- NIST - https://csrc.nist.gov/projects/risk-management/risk-management-framework-(rmf)-overview/security-categorization

Prioritization

Global Security Risk Scoring Tool

Impact	Likelihood	Control Effectiveness
◉ Critical (5)	◉ Almost Certain (5	○ No controls in place or mostly ineffective (1.0)
○ High (4)	○ Probable (4)	○ Controls are rarely effective (0.8)
○ Medium (3)	○ Possible (3)	○ Controls are effective on some occasions (0.6)
○ Low (2)	○ Unlikely (2)	○ Controls effective on most occasions (0.4)
○ Very Low (1)	○ Rare (1)	◉ Controls are highly effective (0.2)

Inherent Risk - 5.0

(Impact + Likelihood)/2 = (5+5)/2 = 5

Residual Risk – 1.0

Inherent Risk * Control Effectiveness = 5 * 0.2 = 1

Risk Scoring

Impact	
Critical (5)	>$10M loss;>10% market share loss
	Loss of executive life
	Severe impact on reputation/brand/member
	Severe/catastrophic harm to individuals
	Severe degradation operational performance.
	>7.5% of member accounts affected.
High (4)	$5M - $10M loss; 7-10% market share loss
	Significant impact on reputation/brand/member
	Long-term negative media coverage
	Severe/catastrophic harm to individuals
	Severe degradation in mission capability
	5% of member accounts affected
Medium (3)	$1M - $5M loss
	Some impact on reputation/brand/member
	National short-term negative media coverage
	Significant harm to individuals
	Significant degradation in mission
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Mostly Effective (0.4)	51-75% of the population
Highly Effective (0.2)	75% of the population

Top security risks - example

Illustrative Only

Risk: Use of third parties to host data and provide cloud services.

Impact: Critical (5) -

- Severe impact to member and reputation
- Severe degradation in mission, not able to perform primary function

Likelihood: Almost Certain (5) –

- Impacting factors outside the control of the organization
- Complex internal process with minimal checks and balances

Known Mitigations - Control Effectiveness (0.4) = Controls are mostly effective

- Third-Party Penetration Testing
- Tiered Security Assessments
- Third-Party Security Controls
- Annual Aetna Global Security Third-Party Conference

Inherent Risk = (5+5) / 2 = 5.0 (Critical)

Residual Risk = 5.0 * 0.4 = 2.0 (Low-Medium)

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Appendix D

Quarterly Top Security Risks

Q4

Current Top Security Risks

Illustrative Only

Risk Themes	Impact	Likelihood	Inherent Risk	Control Effectiveness	Residual Risk	
1. Use of third parties to host data and provide cloud services	Medium (3)	Almost Certain (5)	High	Mostly Ineffective (1.0)	4	High
2. Asset inventory is not complete	Critical (5)	Almost Certain (5)	Critical	Occasionally Effective (0.6)	3	Medium
3. Handling of sensitive data within business processes	Critical (5)	Almost Certain (5)	Critical	Occasionally Effective (0.6)	3	Medium

Current Top Security Risks – illustration only

Illustrative Only

Top Security Risks	Risk Inputs				Control Inputs					
Q4	Incidents	Key Controls Testing Failures	Open and Expired Exceptions	Open and Expired Remediation plans	Control Standards	KPIs	Closed Exceptions	Closed Remediation Plan	Data Analytics Models	Projects Closed
1. Use of third parties to host rdata and provide cloud services	25	8	5	10	0	0	10	5	0	0
2. Asset inventory is not complete	3	0	20	15	4	3	15	2	5	1
3. Handling of sensitive data within business processes	5	0	10	5	1	4	5	10	5	1

Emerging Risk/Risk Categories

Illustrative Only

Risk Category	Risk Inputs				Control Inputs					
Q4	Incidents	Key Controls Testing Failures	Open and Expired Exceptions	Open and Expired Remediation plans	Control Standards	KPIs	Closed Exceptions	Closed Remediation Plan	Data Analytics Models	Projects Closed
Security Management	25	8	5	10	0	0	10	5	0	0
Data Protection Management	3	0	20	15	4	3	15	2	5	1
Access Management	5	0	10	5	1	4	5	10	5	1
IT Hygiene	7	3	1	4	2	2	3	20	1	2
Network and Communications Security	1	1	1	0	3	3	5	2	1	0

Emerging Risk Categories – Q4 2016 view

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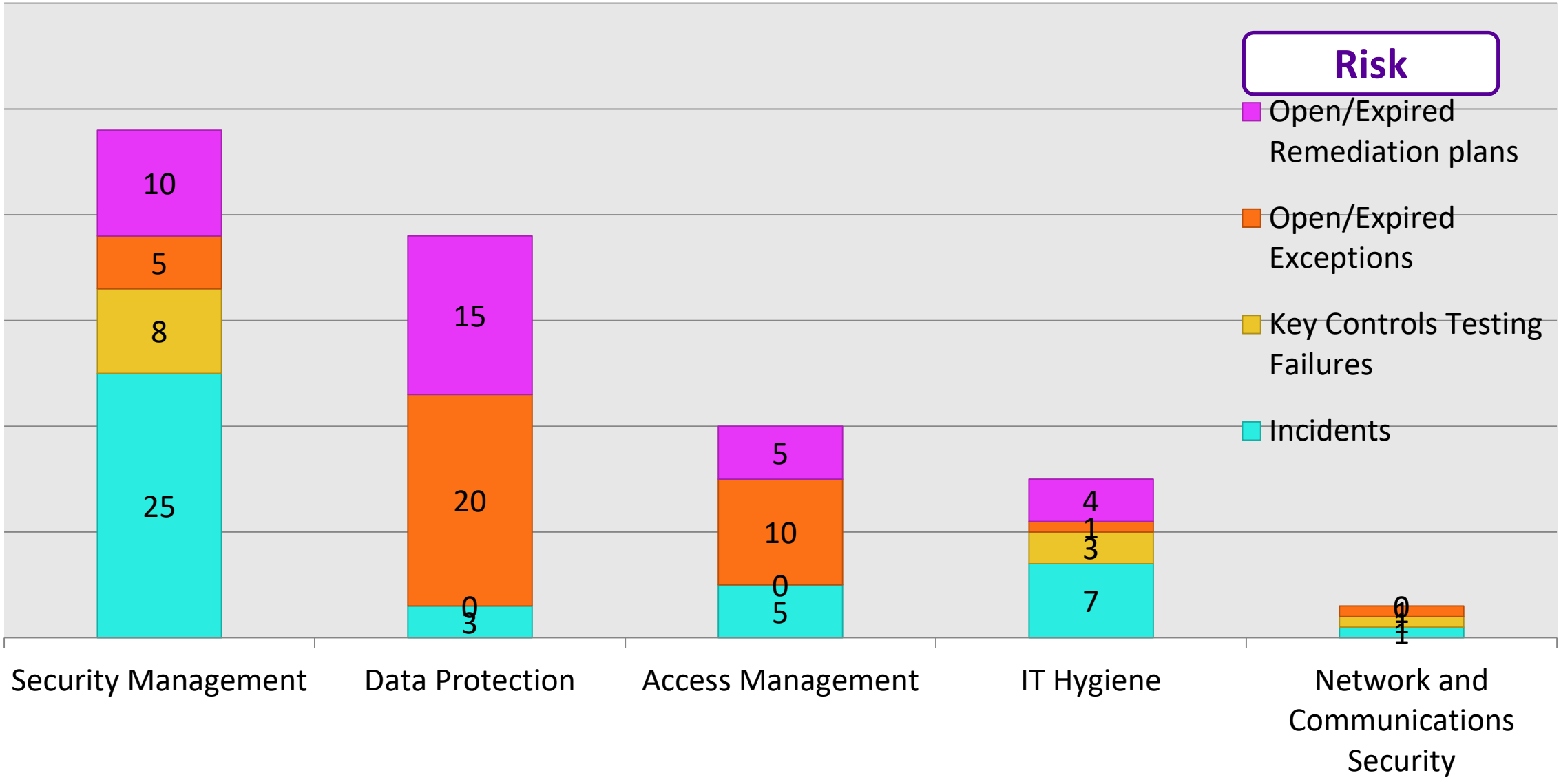

Emerging Risk Categories – Quarterly view

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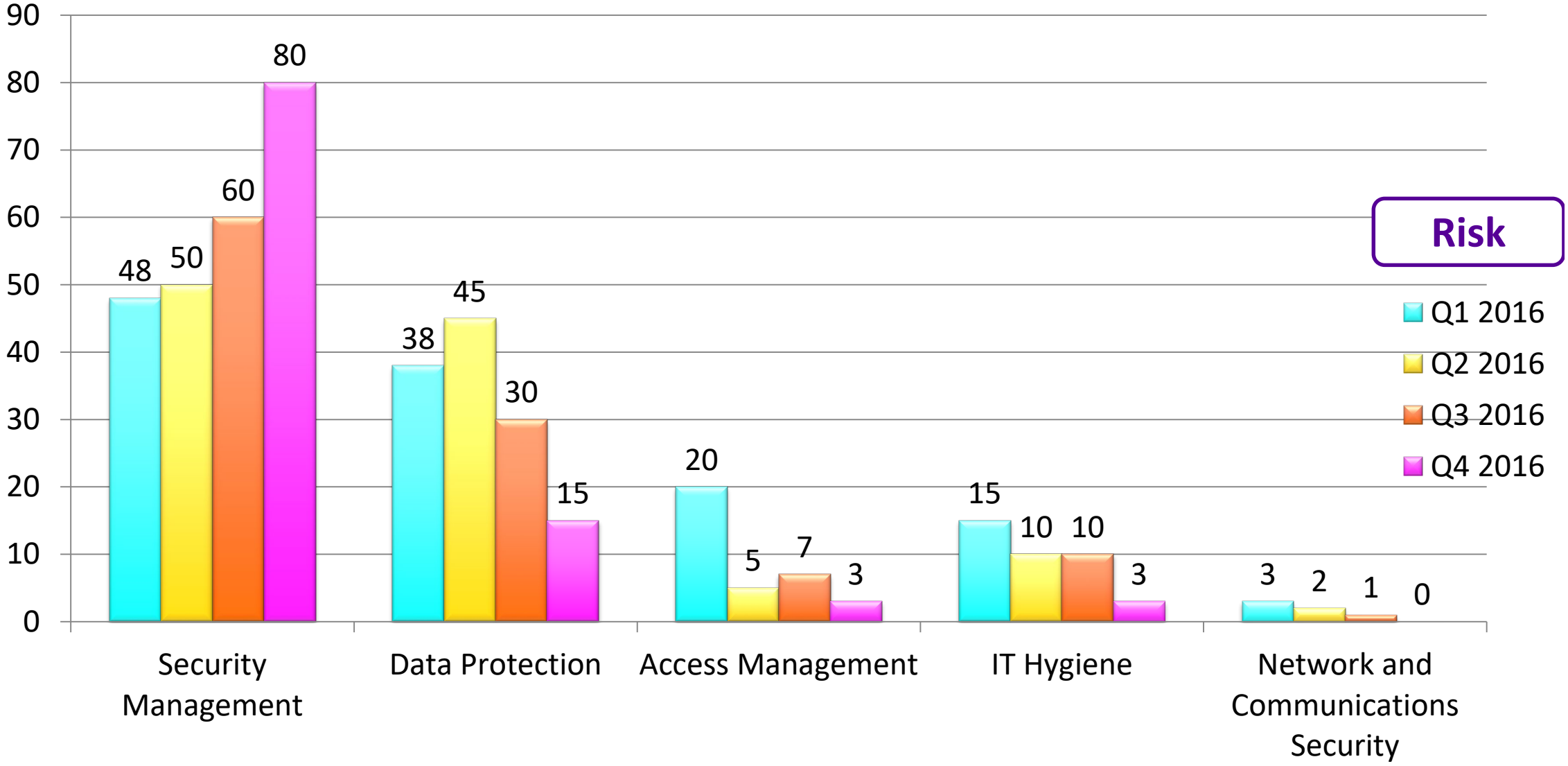

Emerging Risk Categories – Q4 2016 view

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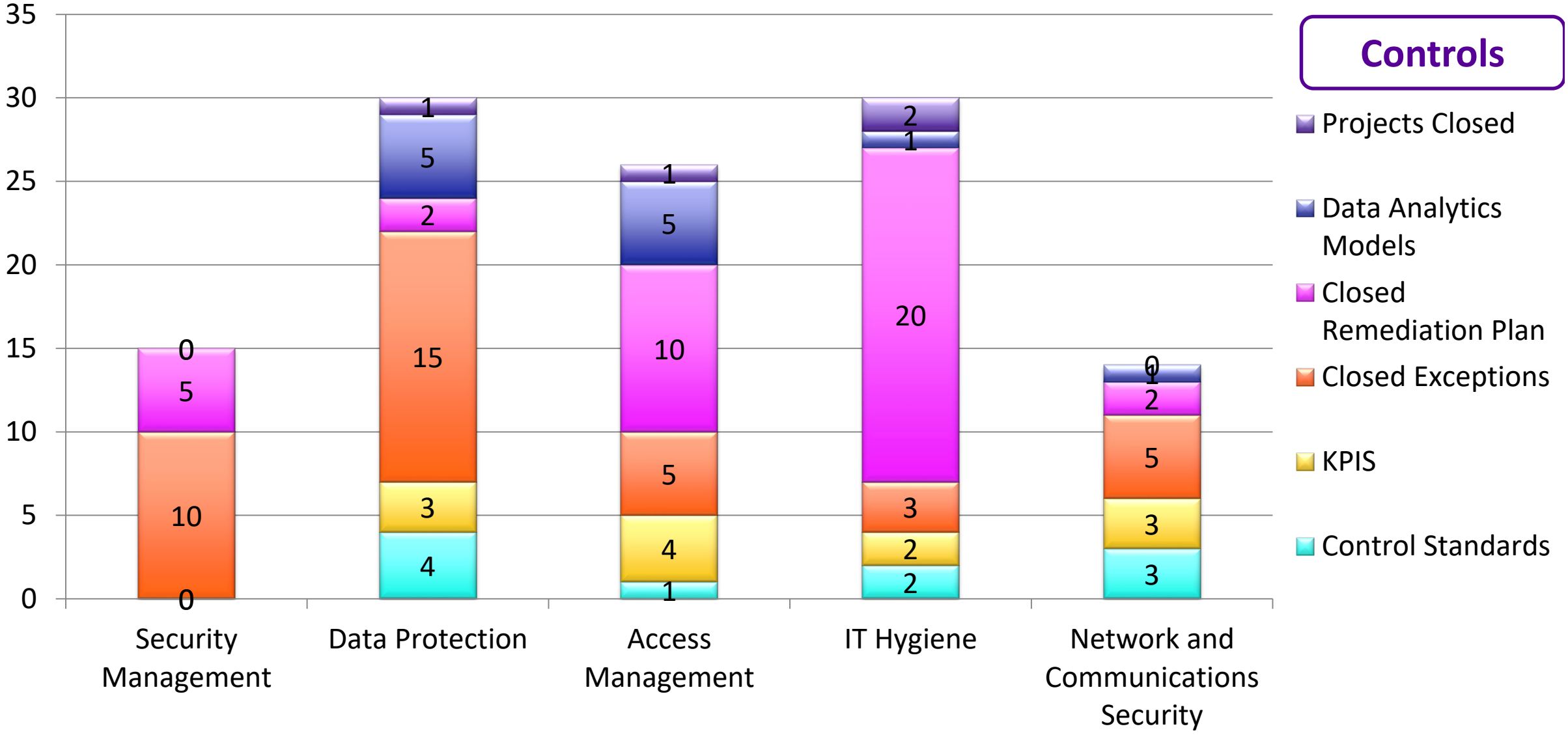

Emerging Risk Categories – Quarterly view

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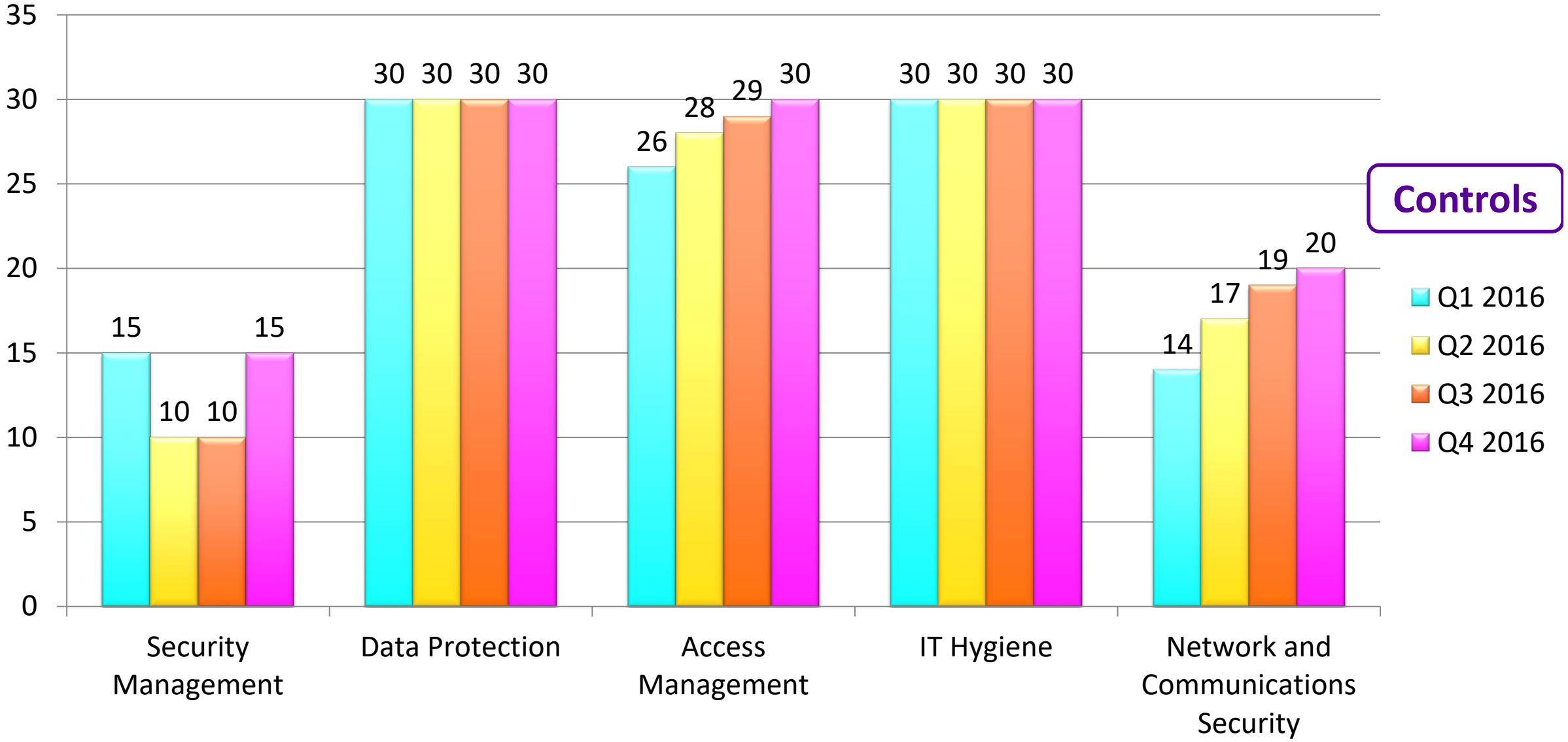

Emerging Risk - External Trends Example

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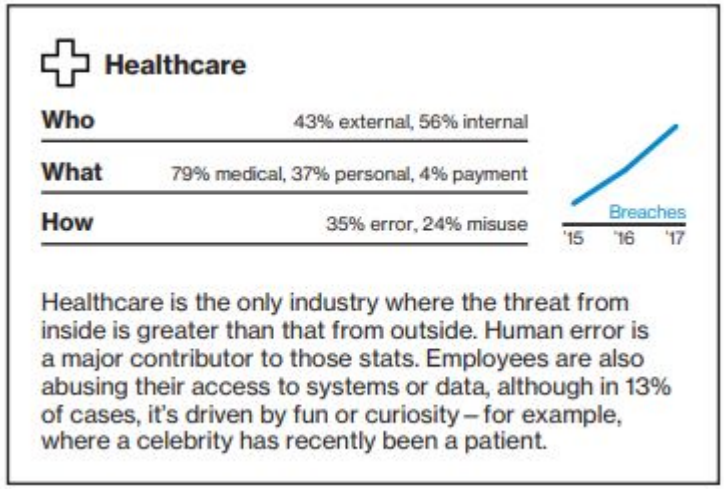
Healthcare Insider Threats



"Verizon 2018 DBIR" produced by verizon.com

Evolution of Ransomware:

- Used in completely opportunistic attacks affecting individuals' home computers as well as targeted strikes against organizations
- Attempted with little risk or cost to the adversary involved
- Successful with no reliance on having to monetize stolen data
- Deployed across numerous devices in organizations to inflict bigger impacts and thus command bigger ransoms

Discussion points

Example only

Illustrative Only

- 3rd Party/Vendor Management continues to be a leading risk/Top Security risks
- Significant risk management activities on data protection with reduction of risk events.
  - Should this remain a Top 10 Security risk?
- New Emerging risk…..

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Appendix E

Daily TVA

Threat Vulnerability Assessment (TVA) Categories

Input Category	Purpose	Sources
Security Incidents	Review of open security events and incidents requiring corrective actions or remediation plans.	• Cyber Incidents, tracked via the eGRC Incident Response
Cyber Threat Fusion Center	Monitor and inspect inbound activity for suspicious patterns that may indicate a network or system attack from someone attempting to break into or compromise a system.	• Network IDS • Endpoint Malware Detection • Phishing Detection
Inside-Out Analysis	Monitor and inspect outbound activity for suspicious or anomalous behavior that may indicate a compromised device or malicious insider.	• Proxy alerts • Data Loss Prevention • Enterprise Cloud Risk Usage
Physical Security	Review inputs from Physical Security for potential IT Security impact, including security incident, business disruptions, and world events.	• Weather • Business Continuity • Physical on premise incidents • Geopolitical events
External Trends	A review of external cyber threats that impact Aetna's threat landscape including brand protection, malware, non-Aetna data breaches, and other threat intelligence items.	• Commercial Intelligence • Industry Sharing Intelligence
Infrastructure	Review infrastructure vulnerabilities and other threats impacting infrastructure health	• System Patching • Vulnerability exploits • Infrastructure control gaps
Applications	A review of Application vulnerability remediation tools and processes	• Vulnerabilities in prod (dynamic) • Vulnerabilities in build (static) • Application attacks • Botnet defense
Internal Composite	A review of internal events impacting Aetna's risk posture.	• Risk exceptions • UBA Workforce Analytics • Privacy & Legal