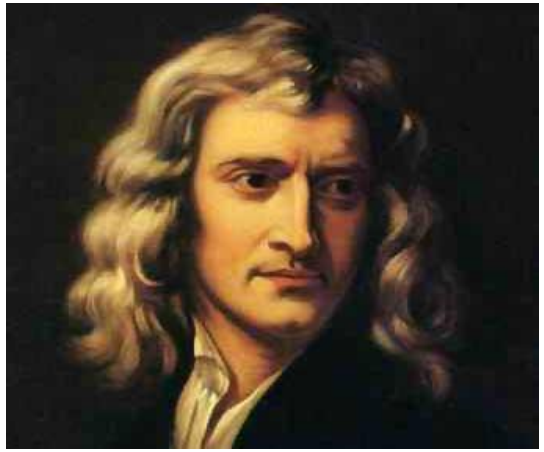
NORTHEASTERN
STATE UNIVERSITY

COLLEGE OF BUSINESS & TECHNOLOGY

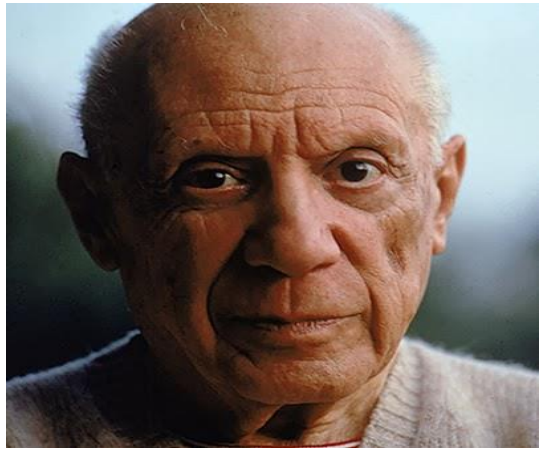
Information Security

A Brief Analysis of the Field

Prologue



“For every action, there is an equal and opposite reaction.”
~ Sir Isaac Newton’s Third Law of Motion



“Every positive value has its price in negative terms” ~ Pablo Picasso

Learning Objectives

- Introduction to Security
- Information Systems Advantages and Disadvantages
- The Need for Security
- Issues
- Treatments
- Security in the Cloud
- Epilogue
- Question and Answer

Introduction to Security

- ***Information security*** refers to the protection of information from unauthorized access or alteration.[1]
- Security Axioms
  1. *"There is no such thing as total security!" – Richard Norton-Taylor*
  2. *"People are the weakest link in cybersecurity!" – SANS, Accenture, CSO*

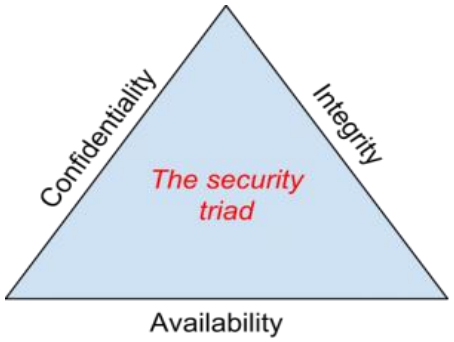
Introduction to Security

- Critical questions[1]
  1. *Are we 100% secure?*
  2. *Do we know what we have?*
  3. *What is important enough to protect?*
  4. *How much will security cost?*
  5. *What are our risks?*

[1] Gupta, Ashutosh, (2021). 5 Security Questions Your Board Will Definitely Ask. Retrieved from Garter Group: https://www.gartner.com/smarterwithgartner/5-security-questions-board-will-definitely-ask

Introduction to Security

- The CIA Triad
  - Confidentiality (C)
  - Integrity (I)
  - Availability (A)



- ***Confidentiality*** refers to preserving authorized restrictions on information access and disclosure, including means for protecting personal privacy and proprietary information.[2]
- ***Integrity*** refers to guarding against improper information modification or destruction and includes ensuring information non-repudiation and authenticity.[3]
- ***Availability*** refers to ensuring timely and reliable access to and use of information by authorized users.[4]

[2] ICS[2], https://www.isc2.org/Certifications/CISSP/CISSP-Student-Glossary#
[3] Ibid
[4] Ibid

Information Systems Advantages & Disadvantages

Advantages

- Blockchain
- Amazon
- Research
- Healthcare
- Weather
- Virtual presence
- No longer considered a “toy”

Disadvantages

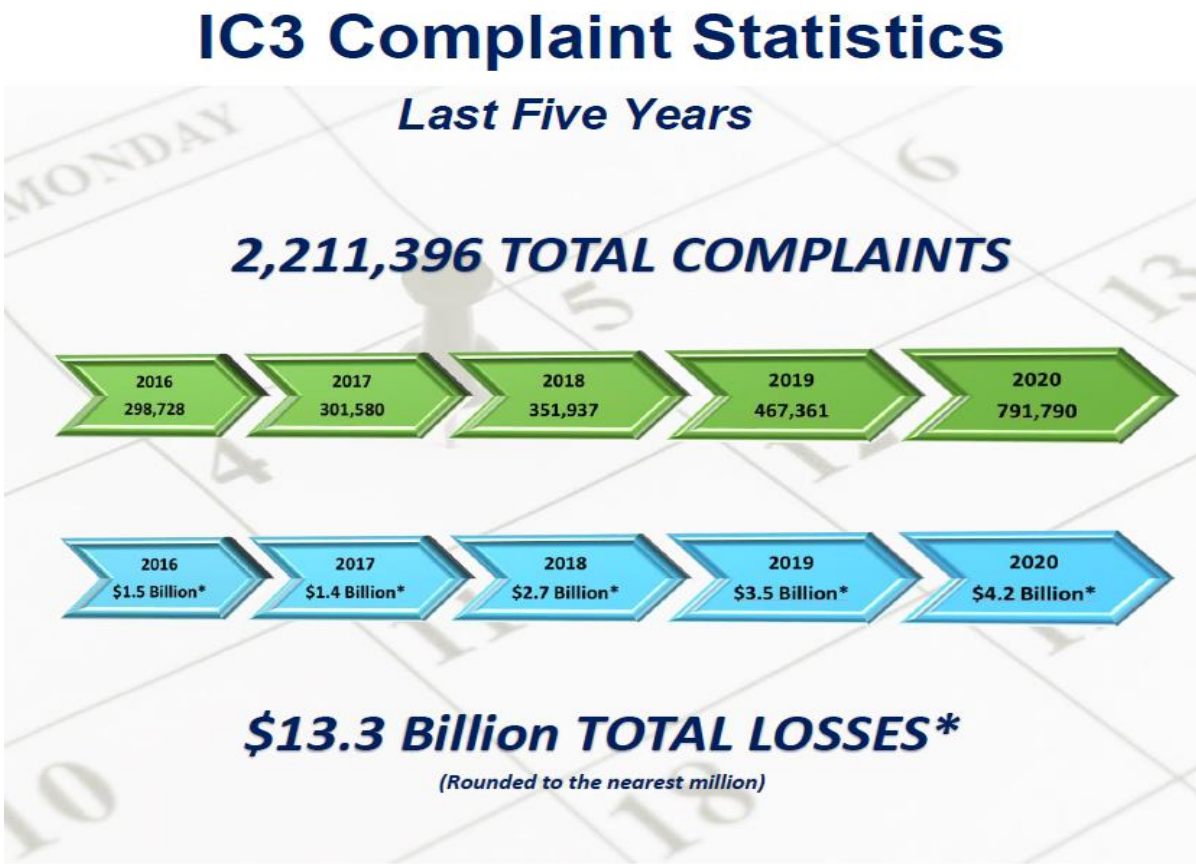
- IS/IT Process Alignment
- Complexity
- Imperfect Data
- Underused
- Low shelf-life
- Security

The Need for Security

Table 1: Organizations' Top 10 Most Important IT Management Issues, 2009-2019

IT Management Concerns/Issues [a]	2019 (% Selecting)	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
n (unique organizations)	618	793	769	801	785	717	484	195	275	172	243
Security/ Cybersecurity/ Privacy [b]	1 (35.9%)	1	1	2	2	2	7	9	8	9	9
Alignment of IT with the Business	2 (33.2%)	2	2	1	1	1	1	2	1	3	2
Data Analytics/Data Management	3 (25.7%)	3	3								
Digital Transformation	4 (22.2%)	7	8								
Compliance and Regulations	5 (20.6%)	6	4	12							
Cloud/Cloud Computing	6 (19.7%)	13	14								
Agility/Flexibility (IT) [c]	7 (19.1%)	8	9	5	9	3	2	3	2	2	3

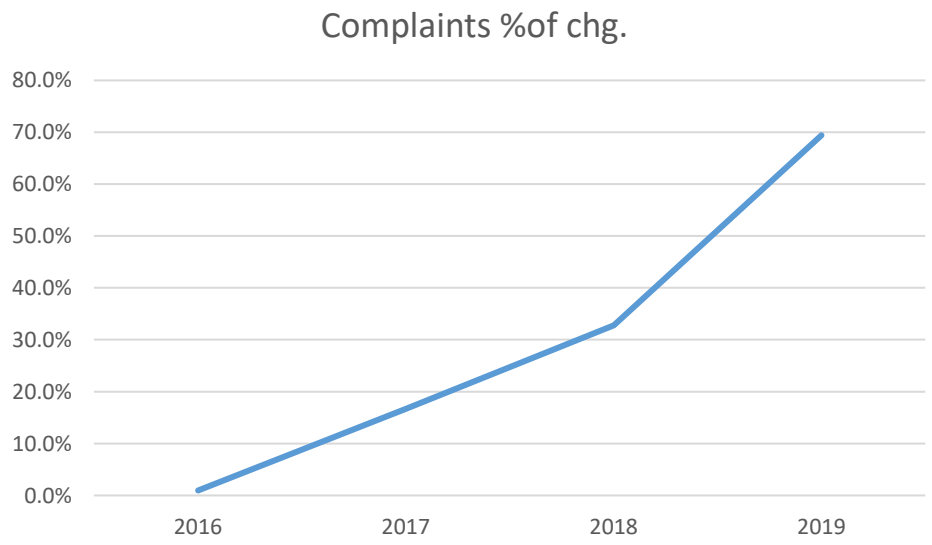
[4] Kappelman et al. (2018) "*The 2018 SIM IT Issues and Trends Study,"* MIS Quarterly Executive (18:1)

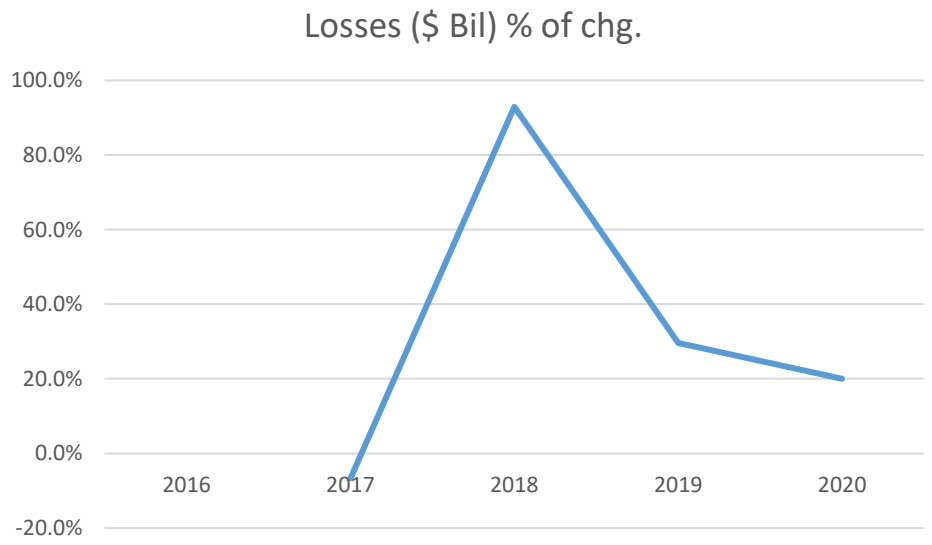


[5] FBI.gov. (2020). *"2020 Internet Crime Report"* https://www.fbi.gov/news/pressrel/press-releases/fbi-releases-the-internet-crime-complaint-center-2020-internet-crime-report-including-covid-19-scam-statistics

The Need for Security

Item	2016	2017	2018	2019	2020
Submitted Complaints	298,728.00	301,580.00	351,937.00	467,361.00	791,790.00
%of chg		1.0%	16.7%	32.8%	69.4%
Losses ($ Bil)	1.5	1.4	2.7	3.5	4.2
% of chg		-6.7%	92.9%	29.6%	20.0%





Issues

Attack	**Damage (Monetary)**
The Love Letter Virus	$10 **bil**[6]
Kevin Mitnick	$300 mil[7]
Slammer	$950 mil - $1.2 **bil**[8]
The Code Red Worm	Billions
Conflicker	$200 mil[9]
Citibank	$2.7 mil[10]
Equifax	$1.4 **bil**[11]
TJX	$17 mil[12]

[4] Griffths, James "*I Love You: How a badly-coded computer virus caused billions in damage and exposed vulnerabilities which remain 20 years on*," CNN, 2020
[5] "*How much Damage Did Mitnick Do?*," Wired.com, 1999
[6] Lemos, Robert "Counting the cost of Slammer," CNET 2003
[7] Danchev, Dancho "*Conficker's estimated economic cost? $9.1 billion,*" ZDNet, 2009
[8] Reuters, "*Hackers stole $2.7 million from Citi*," Reuters, 2011
[9] Schwartz, Mathew "*Equifax's Data Breach Costs Hit $1.4 Billion,*" Bank info Security, 2019
[10] Networkcomputing, "*T.J. Max Breach Costs Hit $17 Million,*" Networkcomputing,com, 2007

Treatments

- Current security practices
- Security framework
- Virus and antimalware protection
- Network and system evaluation
- Patching
- …and

Security and The Cloud

- Cloud adoption
  - Public Cloud
  - Private Cloud
  - Community Cloud
  - Hybrid Cloud
- Statistics
  - In 2020, $371.4 Billion
  - Projected in 2025, $832.1 Billion
  - Approximately 94% of all Enterprises use Cloud Services
  - Cloud security is a top concern for ¾ of enterprises

Security and The Cloud

- Issue: Is it safe to store data in the cloud?
  - It depends
  - Recall Axiom # 1*“There is no such thing as total security!” – Richard Norton-Taylor*
  - 88% of breaches are caused by human error!
- What can you do?
  - Keep appropriate data confidential through policy, access control, and encryption
  - With any service
    - Read the contract carefully
    - Cloud security requires dual effort
    - Assess the service level agreement
    - Ask the question: “Do we do security better than cloud providers?”
    - Are we presupposed to believe (bias) that we are better at security than cloud providers?

Summary

- Information security is important because:
  - Technology permeates society
  - Each positive application of technology results in a negative application (refer to Newton's third law of motion).
  - Most people assume (incorrectly) that they have nothing worth stealing.
  - The more critical applications are automated, the more vigilance we need toward its security.
  - Negative uses of technology hurts the economy and society.
  - COVID has escalated remote connections
  - Threat patterns will escalate to target tele-workers
  - Having a good security program will mitigate potential threats
  - Security is a game of mitigation
  - Government requires more people and organizations to file taxes electronically and store data on the cloud; states are doing it too

Learning Objectives

- Introduction to Security
- Information Systems Advantages and Disadvantages
- Current trends
- Issues
- Treatments
- Security and the Cloud
- Summary
- Question and Answer

Question and Answer