MIS 3534 Fall 2016 – Strategic Management of Information Technology

Week 9 – IT Risk Management

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Today, we will discuss ...

- How should managers communicate and deal with a critical crisis situation?
- What would be the possible consequences of a security failure?
- Considerations and tradeoff in security/risk management

What the h*** is going on here?

- If you were Mr. Barton, how would you explain the situation in Chapter 10 to your CEO, Mr. Carl Williams, *in English*,
  - who you have to assume that has as much knowledge on IT security as *your 70-year old grandma*?
  - Remember that as soon as you use an alien word that he doesn't understand, you'll be fired.

http://judoforlife.com/dev6/31/old-grandma-clipart

Is Something Happening at IVK?

- If you were Mr. Barton, how would you explain the situation in Chapter 10 to Wall Street analysts you’re scheduled to meet today?
  - You can’t lie. If you do, you’ll get sued.
  - You have to be careful. A single word that mistakenly comes out of your mouth can make IVK stock a garbage.

http://en.community.dell.com/dell-blogs/dell-shares/b/dell-shares/archive/2012/06/20/recap-2012-financial-analyst-meeting-dellam12.aspx

What we know and don’t know. (1/2)

- What do we know now for sure?
  - The Web site is locked down due to a sophisticated denial of service attack.
  - The customer service system is unresponsive.
  - Messages that say “Gotcha” are being received.
  - A database index file is renamed.

What we know and don’t know. (2/2)

- What are the things that we are not sure?
  - whether the incidents are related to each other or mere coincidental
  - whether there was a security breach to the customer service system
  - whether the compromise in the database file was due to a security intrusion or a simple malfunction
  - whether any customer information was lost or stolen
  - whether there will be similar incidents or intrusion in the future

Let’s Figure Things Out. (1/3)

- There are several incidents going on here. What are they?
  - Are these somehow related or just coincidental?
- Did an attacker or attackers intrude inside of IVK’s systems?
- How would you explain the difference between a distributed denial of service (DDoS) attack and an intrusion?
  - DDoS is not an intrusion.

http://www.alarme-et-protection.com/tag/intrusion/

BANKING

Was Bank of America Hacked?

By MARTHA C. WHITE | October 5, 2011 | 6

JIN LEE / BLOOMBERG VIA GETTY IMAGES

Seven days after Bank of America instituted a hugely unpopular $5 fee for debit card use and six days into widespread reports from customers about error messages, slow service and other problems accessing the home page or other parts of the bank's website, speculation is mounting that this isn't just a technical glitch. Bank of America spokeswoman Tara Burke says, "The Bank of America online banking site is largely operating normally," although the home screen up on Wednesday morning warned of potential delays in service. This is just "a disclosure of possible issues," she says. People are taking to the blogosphere and social networking sites to gripe about website-related issues and ask: Is this the work of hackers?

http://moneyland.time.com/2011/10/05/was-bank-of-america-hacked/

Let’s Figure Things Out. (2/3)

- Had an intrusion occurred,
  - What would be the motive of an intruder?
  - What would be the targets of an intruder?

http://depositphotos.com/1587738/stock-illustration-Criminal-Thief-Activity.html

Let's Figure Things Out. (3/3)

- How would you explain "*transaction is jammed up*" or "*the database is corrupted*" (p. 164-165)?
  - Is the database working at government?
  - Does it mean that IVK's sensitive information is lost or stolen?
  - What kind of sensitive information does IVK have?
- What does it mean by "*Apparently a database index file had been somehow renamed, and another substituted in its place*"? (p. 167)
  - How bad is it?
  - Is this evidence of an intrusion?

http://www.jaywalk.net/blog/?m=200811

Why is This Happening? (1/4)

- Why do you think this happened?
- If the security upgrade project was funded and completed, could IVK have prevented this completely?
  - What has been missing at IVK, in addition to funding for security?
  - Money cannot eliminate the risk of security incidents or breaches completely.
  - Proper security policies, risk management procedures, and sufficient training and monitoring on employees should be accompanied.
  - *Security is both a technical and a human/managerial issue!*

Why is This Happening? (2/4)

- Why can’t IVK figure out whether an intrusion occurred or something else happened?
  - What could be the smoking gun? (p. 168)
  - Why couldn’t Mr. Cho find the smoking gun?

http://www.memphisflyer.com/CityBeatBlog/archives/2010/04/08/the-morgan-keegan-emails-a-smoking-gun

Why is This Happening? (3 / 4)

- Why are Gordon and Cho shouting to each other? (p. 165-166)
  - What is the "rush-a-change-into-production" thing? (p. 166)
  - What is a proper procedure in updating applications?
- For Cho to find evidence of an intrusion, what does he need?

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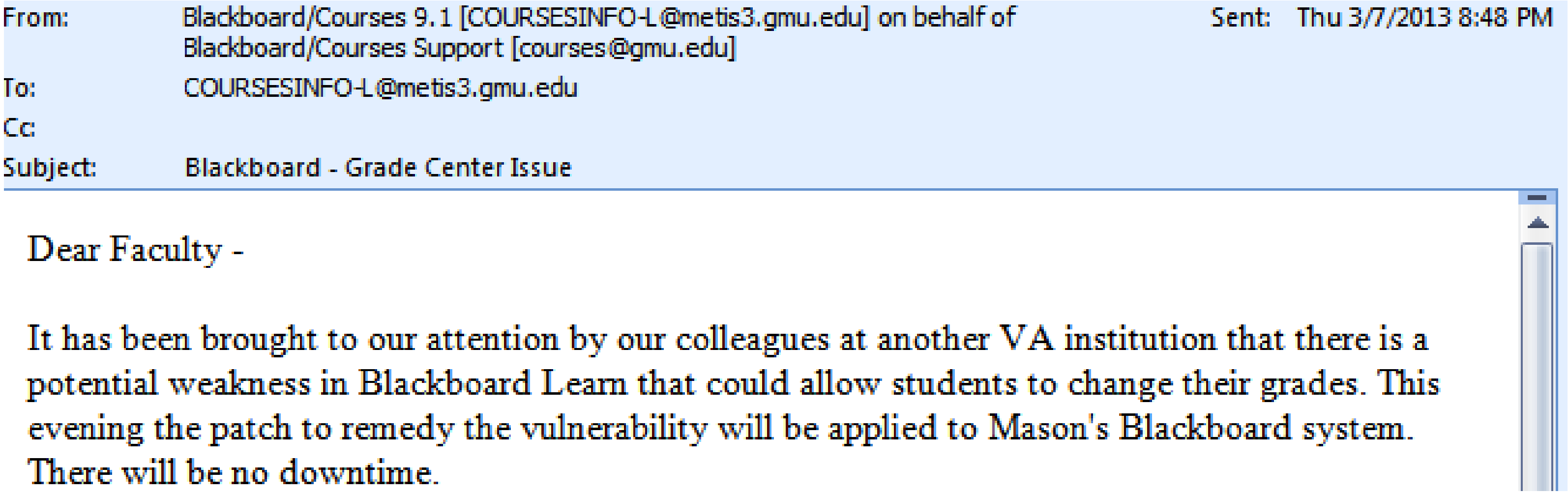
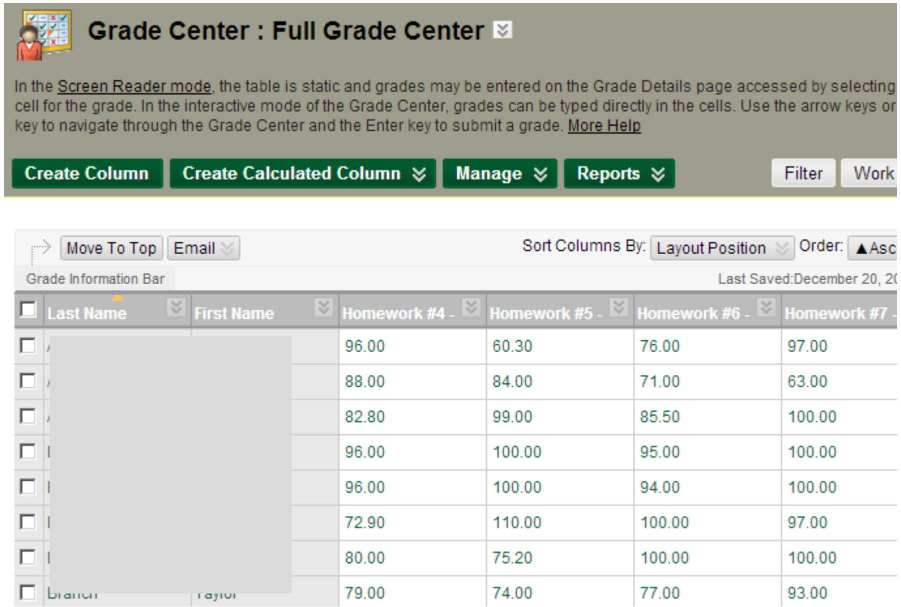


From: Blackboard/Courses 9.1 [COURSESINFO-L@metis3.gmu.edu] on behalf of Blackboard/Courses Support [courses@gmu.edu]
Sent: Thu 3/7/2013 8:48 PM
To: COURSESINFO-L@metis3.gmu.edu
Cc:
Subject: Blackboard - Grade Center Issue

Dear Faculty -

It has been brought to our attention by our colleagues at another VA institution that there is a potential weakness in Blackboard Learn that could allow students to change their grades. This evening the patch to remedy the vulnerability will be applied to Mason's Blackboard system. There will be no downtime.

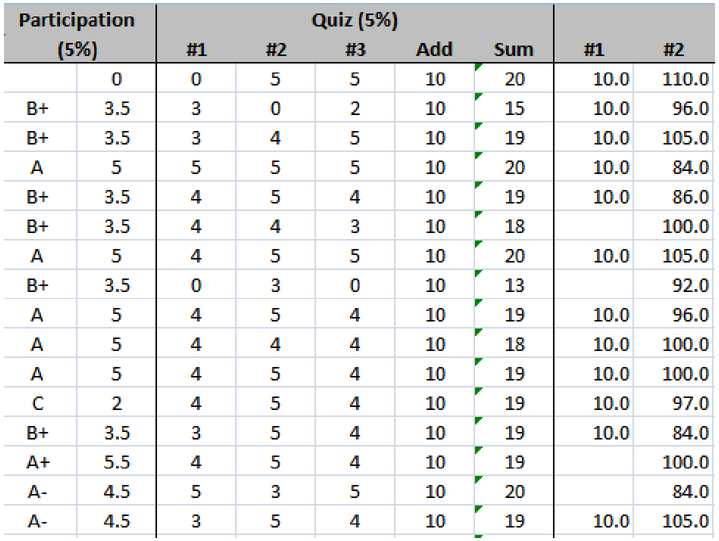


In the Screen Reader mode, the table is static and grades may be entered on the Grade Details page accessed by selecting cell for the grade. In the interactive mode of the Grade Center, grades can be typed directly in the cells. Use the arrow keys or key to navigate through the Grade Center and the Enter key to submit a grade. More Help

Sort Columns By: Layout Position
Order: ▲Asc

Grade Information Bar
Last Saved:December 20, 20

□	Last Name	First Name	Homework #4 -	Homework #5 -	Homework #6 -	Homework #7 -
□	[redacted]	[redacted]	96.00	60.30	76.00	97.00
□	[redacted]	[redacted]	88.00	84.00	71.00	63.00
□	[redacted]	[redacted]	82.80	99.00	85.50	100.00
□	[redacted]	[redacted]	96.00	100.00	95.00	100.00
□	[redacted]	[redacted]	96.00	100.00	94.00	100.00
□	[redacted]	[redacted]	72.90	110.00	100.00	97.00
□	[redacted]	[redacted]	80.00	75.20	100.00	100.00
□	[redacted]	[redacted]	79.00	74.00	77.00	93.00



Participation (5%)		Quiz (5%)						
		#1	#2	#3	Add	Sum	#1	#2
	0	0	5	5	10	20	10.0	110.0
B+	3.5	3	0	2	10	15	10.0	96.0
B+	3.5	3	4	5	10	19	10.0	105.0
A	5	5	5	5	10	20	10.0	84.0
B+	3.5	4	5	4	10	19	10.0	86.0
B+	3.5	4	4	3	10	18		100.0
A	5	4	5	5	10	20	10.0	105.0
B+	3.5	0	3	0	10	13		92.0
A	5	4	5	4	10	19	10.0	96.0
A	5	4	4	4	10	18	10.0	100.0
A	5	4	5	4	10	19	10.0	100.0
C	2	4	5	4	10	19	10.0	97.0
B+	3.5	3	5	4	10	19	10.0	84.0
A+	5.5	4	5	4	10	19		100.0
A-	4.5	5	3	5	10	20		84.0
A-	4.5	3	5	4	10	19	10.0	105.0

Why is This Happening? (4/4)

- What has been missing at IVK is proper policies and procedures
  - that ensure <u>security and integrity</u> of the systems.
  - All information and files are accurate, completed, and uncompromised.
- Every access and activity anywhere in the systems was supposed to be logged and monitored.
  - Had there been complete log files for system access, Mr. Cho could have found out if it was an intrusion or a simple accident (error, bug, or malfunction).
  - At this moment, IVK IT group is not able to figure out who (insider or outsider) did what nor what caused an error.

Policies and Procedures for Applications

- There should be separate
  - the development (testing) servers and
  - the production servers where applications are actually running.
- All changes must be done in the development servers first and updated to the production servers when business is most idle (e.g. Sunday 1 – 3am).
  - The business units would have to wait several days for their updates to be reflected.
- "Rush-a-change-into-production" is like fixing a car while driving.

Policies and Procedures for Database

- What kind of a disaster situation can we think of at a database?
  - Loss of important data or files
  - Compromise in database access (stolen ID and passwords)
- What should be among the preventative measures for a database failure?

http://sct.emu.edu.tr/courses/it/?id=ITEC313

Policies and Procedures for Data Center

- What kind of a disaster situation can we think of at a data center?
  - Fire, flood, lightening, power outage, earthquake, and so on.
- What should be among the preventative measures for a data center failure?

http://www.igst.com/datacenters.php

How About Personal Devices?

- What kind of a disaster situation can we think of from personal devices (PC, tablets, cell phones)?
  - An unprotected, unguided personal device of an employee could be a starting point for an attack into inside of the company.
- What should be among the preventative measures for a failure due to personal devices?
  - Employees would not be happy about the preventative measures, which cause inconvenience in them.

What Could Happen? (1/3)

- What would be the ramifications of this crash? (*Imagine the worst.*)
  - possibly more severe security collapse
  - breach on customer information and identity thefts with it
  - lawsuits from customers, shareholders, or other stakeholders
  - criminal charges
  - government sanctions

http://www.wallpapervortex.com/wallpaper-18160_1_miscellaneous_digital_art_apocalyptic_destruction_destroyed_city.html

What Could Happen? (2 / 3)

- Why did Mr. Wells, IVK VP of Legal, demand to pull the plugs?
  - Why did Mr. Barton refuse?
  - Who made the right call? Wells or Barton? Why?

https://sites.lafayette.edu/evst100-fa13/2013/10/08/pulling-the-plug/

What Could Happen? (3/3)

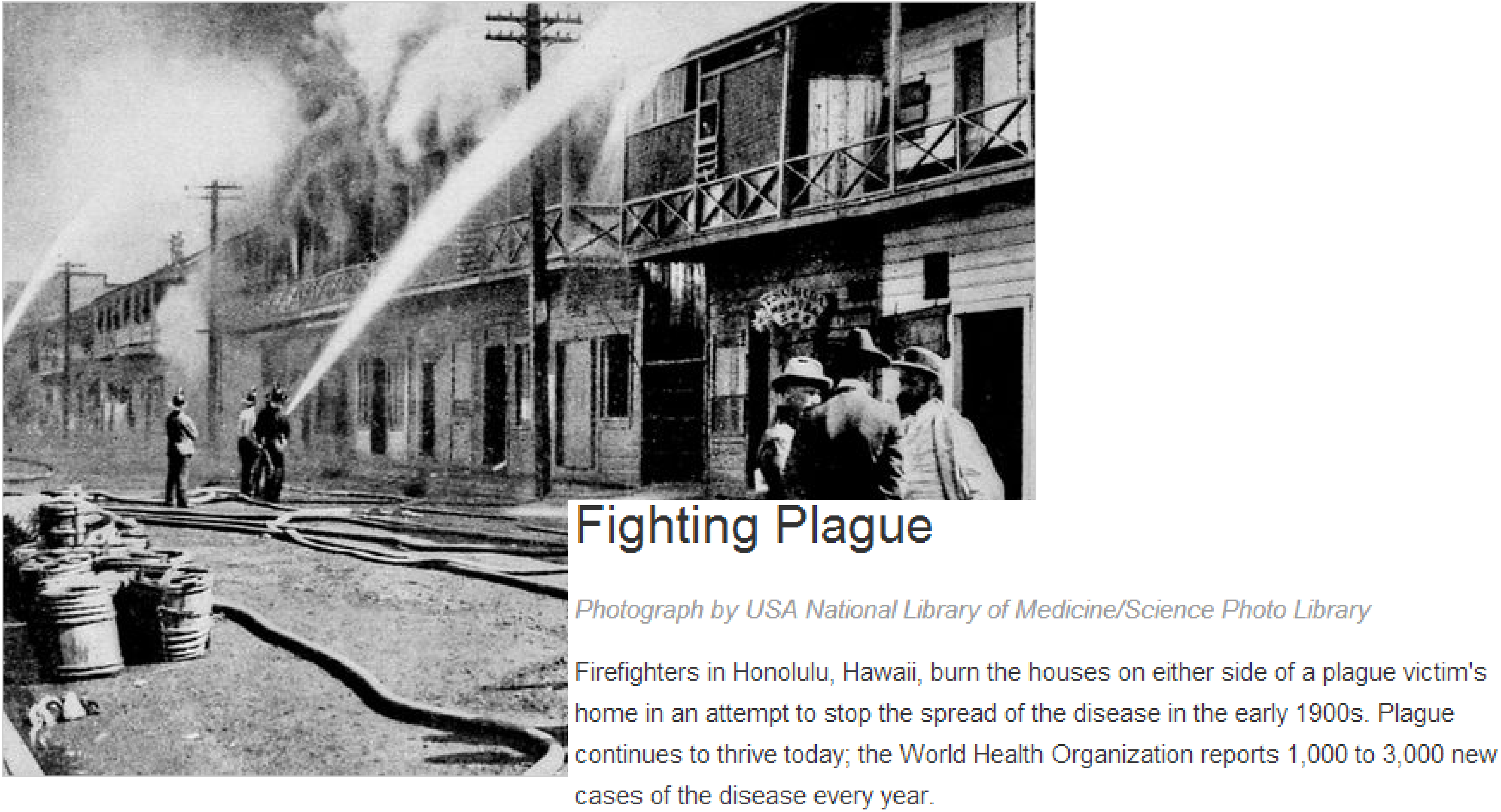
- Mr. Barton refused to pull the plugs because, by doing so, IVK could lose evidence and traits to the perpetuator(s).
- Pulling the plugs could be perceived as a cover-up by external investigators and shareholders.
    - It could cause a bigger legal problem.
- What has been done is done. Pulling the plugs do not eliminate the damages that have been made.

Now what? (1/4)

- What are the three recovery options that IVK IT group is considering?
- How would you explain "*wipe production servers clean, and rebuild the production configuration*" (p. 170) to Mr. Williams?
  - How would you respond if he asks why it is necessary?
- How would you explain "*set up parallel systems built from development files, then switch over the those*"?

http://www.whitecanyon.com/wipedrive-erase-hard-drive

Why burning houses to fight plague?



Fighting Plague

Photograph by USA National Library of Medicine/Science Photo Library

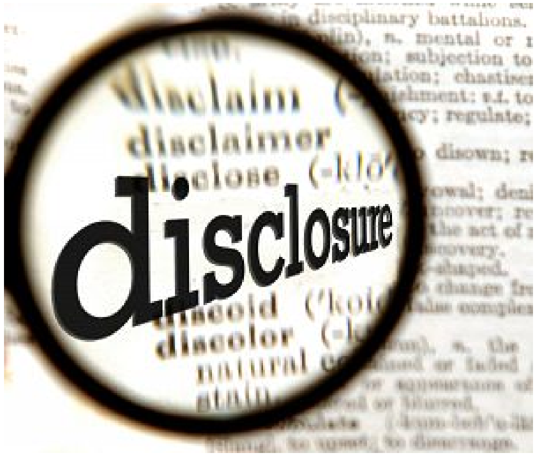
Firefighters in Honolulu, Hawaii, burn the houses on either side of a plague victim's home in an attempt to stop the spread of the disease in the early 1900s. Plague continues to thrive today; the World Health Organization reports 1,000 to 3,000 new cases of the disease every year.

Now what? (2/4)

- Do nothing
- Shut down the company and rebuild critical production systems
- Build a mirror site and rebuild original production systems
- What is the least costly option?
- What is the most costly option?
- What is the most conservative option?
- What is the most risky option?
- Does Option #2 guarantee a 100%, risk-free, and fail-safe system?

Now what? (3/4)

- What is another decision to make?
  - Disclose or not disclose
  - To whom?
- What are the reasons to disclose the security incidents?
- What would be the reasons not to disclose?



http://awakeningnow2012.com/2011/05/24/disclosure-is-in-full-swing/

Now what? (4/4)

- What are the reasons to disclose the security incidents?
  - It is a contractual responsibility to disclose incidents to customers and compensate them for possible damages.
  - It is a fiduciary and legal responsibility to disclose material information to shareholders.
- What would be the reasons not to disclose?
  - The full extent of the incidents is still unknown. It might be more prudent to figure out what really happened first and not to overreact and over-disclose.

Five Alternatives

- There are the five possible alternatives for action. What are they?
  - Do not disclose. / Do nothing.
  - Do not disclose. / Shut down the company.
  - Do not disclose. / Build a mirror.
  - Disclose. / Shut down the company.
  - Disclose. / Build a mirror.

http://blogs.fit.edu/blog/student-stories/sonia/an-applied-mathematics-major-explores-her-post-graduation-options/

Financial Analysis

- If we are to calculate the cost of each option, what should be considered?
    - Immediate costs and damages
    - Chances of future intrusion
    - Damages from a future intrusion

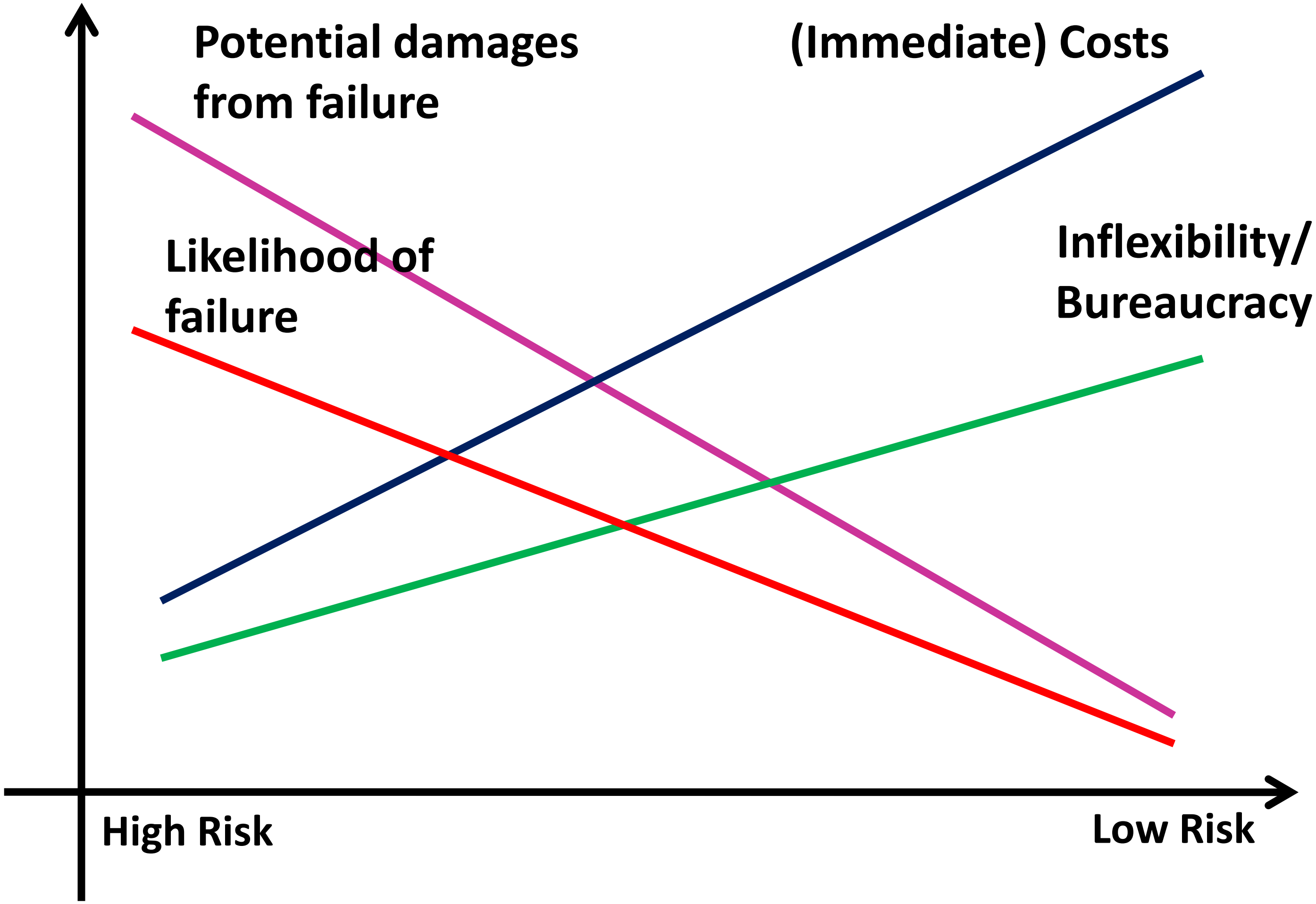
Financial Analysis

Action 1	Do Nothing	Shut Down	Build Mirror	Shut Down	Build Mirror
Action 2	**Do Not Disclose**			**Disclose**	
Immediate Cost/Damage • Service Discruption • Rebuilding Costs • Damages to Reputation • Ohers					
Chance of Future Intrusion (%)					
Cost/Damage with Future Intrusion • Loss to Shareholder Value • Legal Costs • Others					
Total Expected Cost					

Tradeoff in Risk Management

- With “policies and procedures”, we would lose what?
  - flexibility
  - responsiveness to business needs
  - innovation / experiments
  - speed, agility
- Is a 100% secure, risk-free, and fail-safe system a virtue?
  - Does IVK need such a system?
  - If not, which level of security and risk do we have to choose?
  - Depends on what?

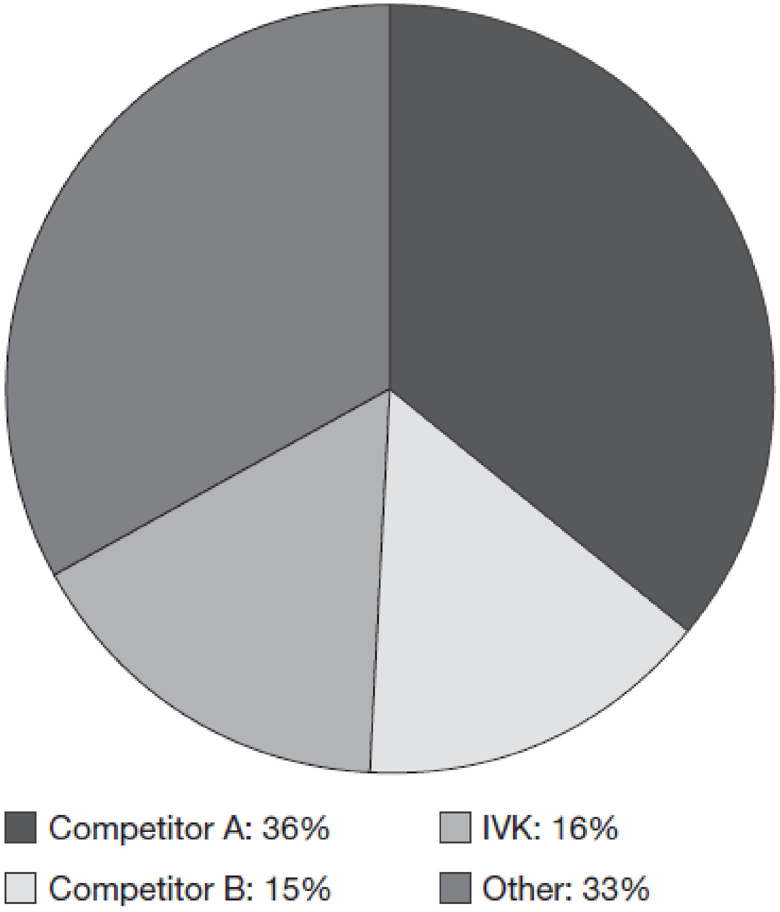
Which level of security/protection to choose?



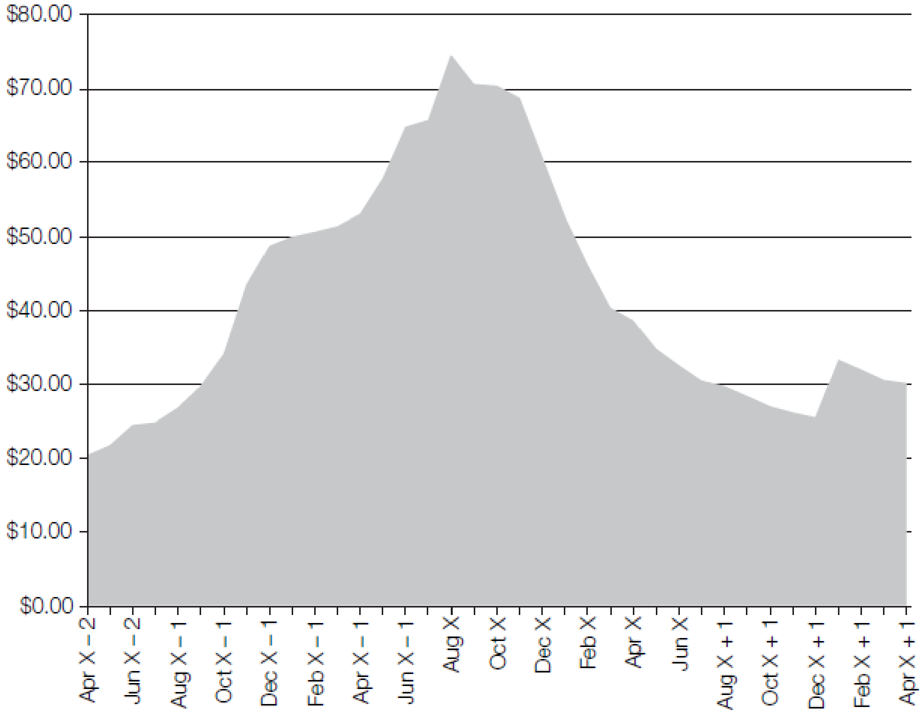
Mr. Williams' Decision

- Why has Mr. Williams decided to do nothing and not to disclose the incident? What was his thinking?
- Did he make a right call?
- How would you explain his decision with the graph in the previous page?

The Status Quo of IVK

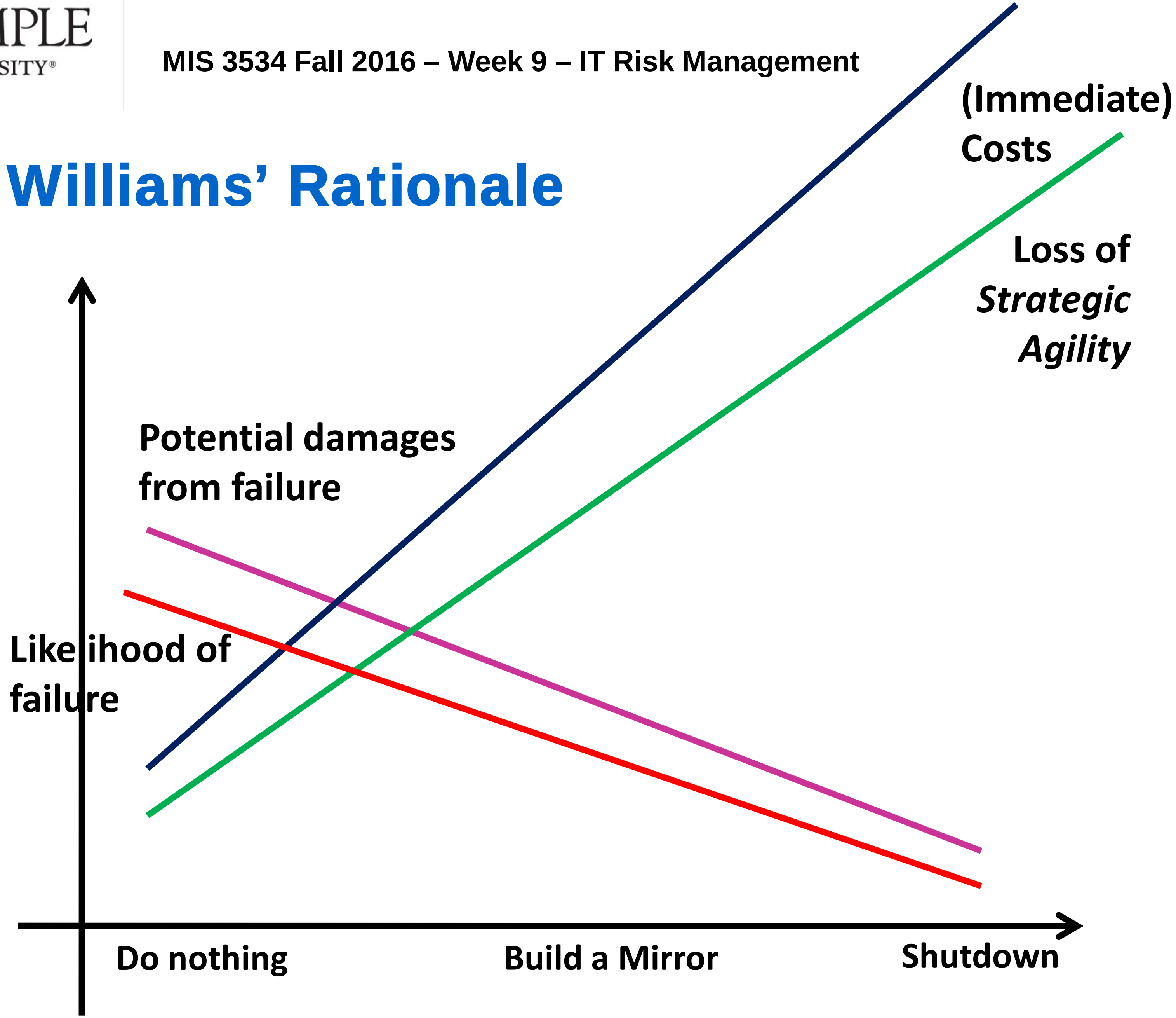


Stock Price for IVK Corporation



- If IVK was #1 in the industry, would Williams still do nothing?

Mr. Williams' Rationale


(Immediate) Costs
Loss of *Strategic Agility*
Potential damages from failure
Likelihood of failure
Do nothing
Build a Mirror
Shutdown