Risk Management MN220:
Seminar 7: IT Risk

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Information security risk management

- Introduction
- History
- Information technology
- Information security
- Risks, threats and vulnerabilities
- History of the Internet
- Information security risk management
- Standards (AS/NZS ISO/IEC 17799:2006, AS/NZS ISO/IEC 27001:2006, COBIT)
- Information security management system (ISMS)
- Case study

New threats in Organisational information Security

https://www.youtube.com/watch?v=nMBFgwb-4h4

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Risk that sometimes occur!

History

- IT systems were standalone
- Risk assessments focused on technical vulnerabilities
- IT risk assessment was the domain of IT professionals
- IT systems have become interconnected
- The Internet has connected the world increasing the vulnerabilities in information security

Information technology

1980’s PC - IBM 286-10Mhz, 5MB RAM

1990’s Internet connection - 4.4 Kbps dialup connection

2000’s PC - Pentium- 3Ghz, 4-16 Gigabit RAM

2000’s Internet connection - 2 Mbps asynchronous broadband

National Broadband Network (NBN)

Information security

- Information is available on numerous computer systems
- Information is distributed widely
- Many people have access to more information
- Privacy is now a greater issue (with respect to electronic records)
- The legal framework has changed

What is information?

“Information is an asset which, like other important assets, has value to an organisation and consequently needs to be suitably protected.” [1]

- 1 AS/NZS ISO/IEC 17799:2006 Information technology – Security techniques –Code of practice for information security management.

What is information security?

“Preservation of confidentiality, integrity and availability of information; in addition, other properties, such as authenticity, accountability, non-repudiation, and reliability can also be involved.” 2

- 2 AS/NZS ISO/IEC 17799:2006 Information technology –Security techniques –Code of practice for information security management.

Enterprise information security

Biggest Information Security Breaches

•http://www.csoonline.com/article/2130877/data-protectionhe
-15-worst-data-security-breaches-/data-protection/the-15-worst-data-security-
breaches-of-the-21st-century.html

EIM- Enterprise Information Management

- https://www.youtube.com/watch?v=2YnMu3hiGfQ
- https://www.youtube.com/watch?v=13wV_Qq8YCo
- https://www.youtube.com/watch?v=9eQuEEKtjHs

Preservation of information

Confidentiality:

- To ensure information is available to only those with authorisation to access it

Integrity:

- To ensure information and information processing systems remain accurate and complete

Availability:

- To ensure information is available to those with authorisation as and when they require it

Risks, threats, and vulnerabilities[3]

Risk:

- "Combination of the probability of an event and its consequence."

Threat:

- "A potential cause of an unwanted incident, which may result in harm to a system or organization."

Vulnerability:

- "A weakness of an asset or group of assets that can be exploited by one or more threats."

- 3 AS/NZS ISO/IEC 17799:2006 Information technology –Security techniques –Code of practice for information security management.

Threat types

Natural and accidental threats:

- Non-intentional threats (accidents);
- Earthquakes, fires, floods, lightening.

Malicious threats:

- Intentional threats caused by people, organisations, governments.

Malicious threat agents[4]

Malicious threat agents have the following characteristics:

- Capability
- Motivation
- Catalysts
- Access
- Inhibitors
- Amplifiers

[4] Jones. A., Ashenden. D., Risk management for computer security

Motivation

Motivation to carry out a threat may arise due to one or a number of the following:

- Personal gain or ambition
- Political interests
- Religious belief
- Power
- Revenge
- Curiosity
- Terrorism

Capability

For threats to be carried out requires capability:

- *A computer hacker needs to have knowledge and skill*
- *The theft of a person's identity requires knowledge and skill*

Therefore threat assessments need to take into consideration the capabilities of the suspected perpetrators.

Opportunity

For threats to be carried out the opportunity must exist for the attack to take place:

- Open doors;
- Unattended systems and computers;
- Easy electronic access to information and systems; and
- Weak security systems.

Catalyst

A catalyst is required to cause a threat agent to select a target:

- Disaffected employee;
- Past employee;
- Supplier losing a contract;
- Sub-contractors;
- Change in technology.

Inhibitors

Inhibitors may affect the target or the threat agent:

- Security policy;
- Security systems;
- Physical barriers to the source of information;
- Fear of being caught (threat agent).

Vulnerabilities

Operating systems:

- Identified by “code crackers”
- Manufacturers issue “patches”

Software applications:

- “Easter eggs”

Connectivity and dependence:

- The Internet

History of the Internet

1967 - First packet switched network developed in UK

1969 - ARPANET deployed in USA

1970 - First email system developed

1972 - FTP (File Transfer Protocol) developed

1991 - World Wide Web developed by Sir Tim Berners-Lee and Robert Cailliau.

Downside of the Internet

- Hacking
- Denial of service (DOS) attacks
- Intellectual property theft
- Spying
- Industrial espionage
- Terrorism
- Phishing (to obtain confidential information from Internet users, by sending e-mails appearing to be from a legitimate organisation)
- Fraud
- Cyber stalking

AS/NZS ISO/IEC 17799:2006 Information technology – Security techniques – Code of practice for information security management

1 Scope

2 Terms and definitions

3 Structure of Standard

4 Risk assessment and treatment

5 Security policy

6 Organization of information security

7 Asset management

8 Human resource management

AS/NZS ISO/IEC 17799:2006

9 Physical and environmental security

10 Communications and operations management

11 Access control

12 Information systems acquisition, development and maintenance

13 Information security incident management

14 Business continuity management

15 Compliance

Information security risks

- Identify assets;
- Information assets;
- Paper documents;
- Software assets;
- Physical assets;
- Marketing assets;
- Services.

IT SECURITY RISK ASSESSMENT

Part 2- https://www.youtube.com/watch?v=rrbX0cWqE6E
Part 3- https://www.youtube.com/watch?v=CaC83WG3zUo

Threats and vulnerabilities

Identify threats to the business:

- Hackers
- Competitors
- Terrorists
- Identify vulnerabilities: ***identifying***, quantifying, and prioritizing (or ranking) the ***vulnerabilities*** in a system
- Operating systems
- Software
- Business processes

Risk assessment and risk management

Similar process to AS/NZS ISO 31000

- What can go wrong, where, by whom ??

Control framework provided in AS/NZS ISO/IEC 27001

- 133 controls across 11 areas within the framework

Conduct risk assessment, risk treatment, communicate and consult, monitor and review.

Developing the Information Security Management System (ISMS)

Based on *PDCA* model of ISO 9001, Quality management

Plan (establish the ISMS)

Do (implement and operate the ISMS)

Check (monitor and review the ISMS)

Act (maintain and improve the ISMS)

ISO27001- Information Security Management System (Framework)

https://www.youtube.com/watch?v=tuAYS5fRnpk

https://www.youtube.com/watch?v=Ts-MA-2uN7U&list=PLIJfa7A9NEtSeK6zvoMiUxjjZ_DLSFpq9

Adobe Acrobat Document

(OECD Guidelines /Principles for ISMS)

- Awareness
- Responsibility
- Response
- Risk Assessment
- Security design and implementation
- Security Management
- Reassessment

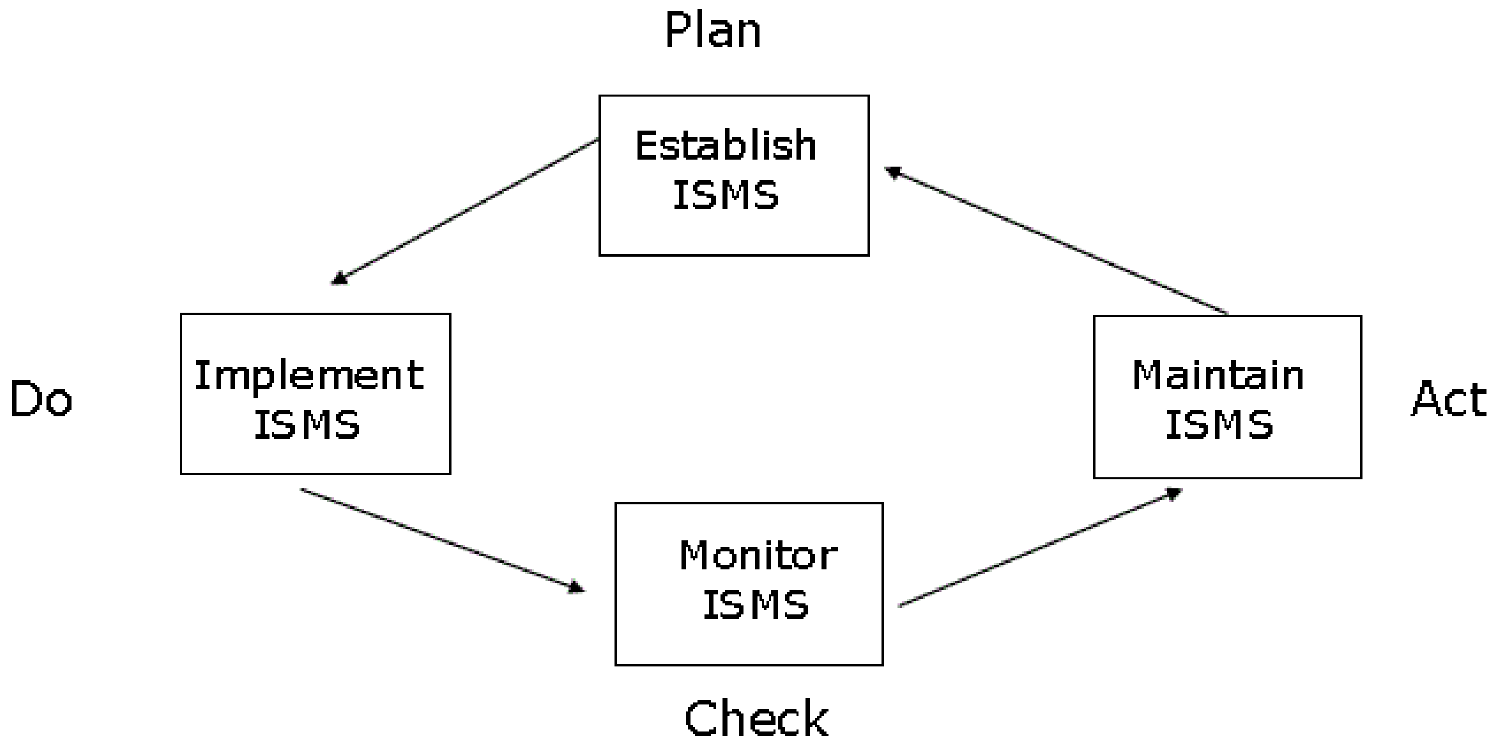
IMPT: See Annex B of ISO27001:2006 for mapping to PDCA

(Australian Privacy Act 1988)

- Australian Privacy Principle 1 — Open and transparent management of personal information
- Australian Privacy Principle 2 — Anonymity and pseudonymity
- Australian Privacy Principle 3 — Collection of solicited personal information
- Australian Privacy Principle 4 — Dealing with unsolicited personal information
- Australian Privacy Principle 5 — Notification of the collection of personal information
- Australian Privacy Principle 6 — Use or disclosure of personal information
- Australian Privacy Principle 7 — Direct marketing
- Australian Privacy Principle 8 — Cross-border disclosure of personal information
- Australian Privacy Principle 9 — Adoption, use or disclosure of government related identifiers
- Australian Privacy Principle 10 — Quality of personal information
- Australian Privacy Principle 11 — Security of personal information
- Australian Privacy Principle 12 — Access to personal information
- Australian Privacy Principle 13 — Correction of personal information

Adobe Acrobat Document

Develop the ISMS[5]



Plan

Establish ISMS

Do

Implement ISMS

Check

Monitor ISMS

Act

Maintain ISMS

[5] AS/NZS ISO/IEC 27001:2006 Information technology – Security techniques – Information security management systems - Requirements

Choice Point Case study:

Structure of the RMP – just a guide[4]

- Introduction/Executive Summary
- Definitions or glossary of terms (terminology used in the RMP)
- Objectives (of risk management plan)
- Risk management policy
- **Interrelationship with strategic planning**
- **Interrelationship with corporate governance**
- **Organization and responsibilities/ accountability**
- **Communication and consultation**
- **Risk management framework (context, stakeholders, tools, matrix, criteria)**
- **Risk management processes (methodology)**

GROUP 1

GROUP 2

4. Moore, P

Structure of the RMP – cont'd

In the Appendix

- Risk register (Top 5 Risks only – 1 representative to brainstorm)
- Risk profile
- Risk appetite and tolerance
- Risk treatment plans
- Monitor and review
- Risk management programme
- Performance measurement of the plan
- Risk management implementation plan
- Appendices (sub reports)

GROUP 3

GROUP 4

STUDENT ARTICLE REVIEW

Choice Point Case study- Lecturer to discuss questions below with students

- What has happened? (the event)

- What was the root cause? (contributing factors)

- What could have been done to prevent it? (controls)

- How could the IMS managers better managed IM security breaches? (project managers and work executors)

- What were the risks and outcomes for the Public/clients, the company , internal stakeholders and staff? (take different perspectives and contexts)

Summary

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- Information security management system (ISMS).