



Analisis Resiko Sistem Informasi

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Risk analysis definition

Pertemuan 2

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Prodi Sistem Informasi - Fakultas Ilmu Komputer

Risk Analysis

Outline

- What is risk analysis?
- What terms are needed in risk analysis?
- What are assets?
- What are vulnerabilities?
- What are threats?
- What types of risk exist?
 - Security Risk
 - Physical Asset Risks
 - Mission Risks
 - Security Risks

Example: Airport security



List of possible measures

1. Scissors etc. not allowed
2. ID check (photo ID must be presented)
3. Only the person named on the ticket can travel
4. X-rays
5. Lighters are not allowed anywhere in the airport (...it's time to quit smoking)
6. Biometrics
7. Boot your laptop to see if it has a battery
8. Lock the captain's cabin
9. Armed guards on board
10. Interview all passengers before boarding

In such a complex environment...

- Total security is out of the question
 - People's behaviour is unpredictable
 - We cannot account for all possible threats and we cannot detect all vulnerabilities.
 - Security costs money; and also time, people and other resources.
- So, what shall we do?

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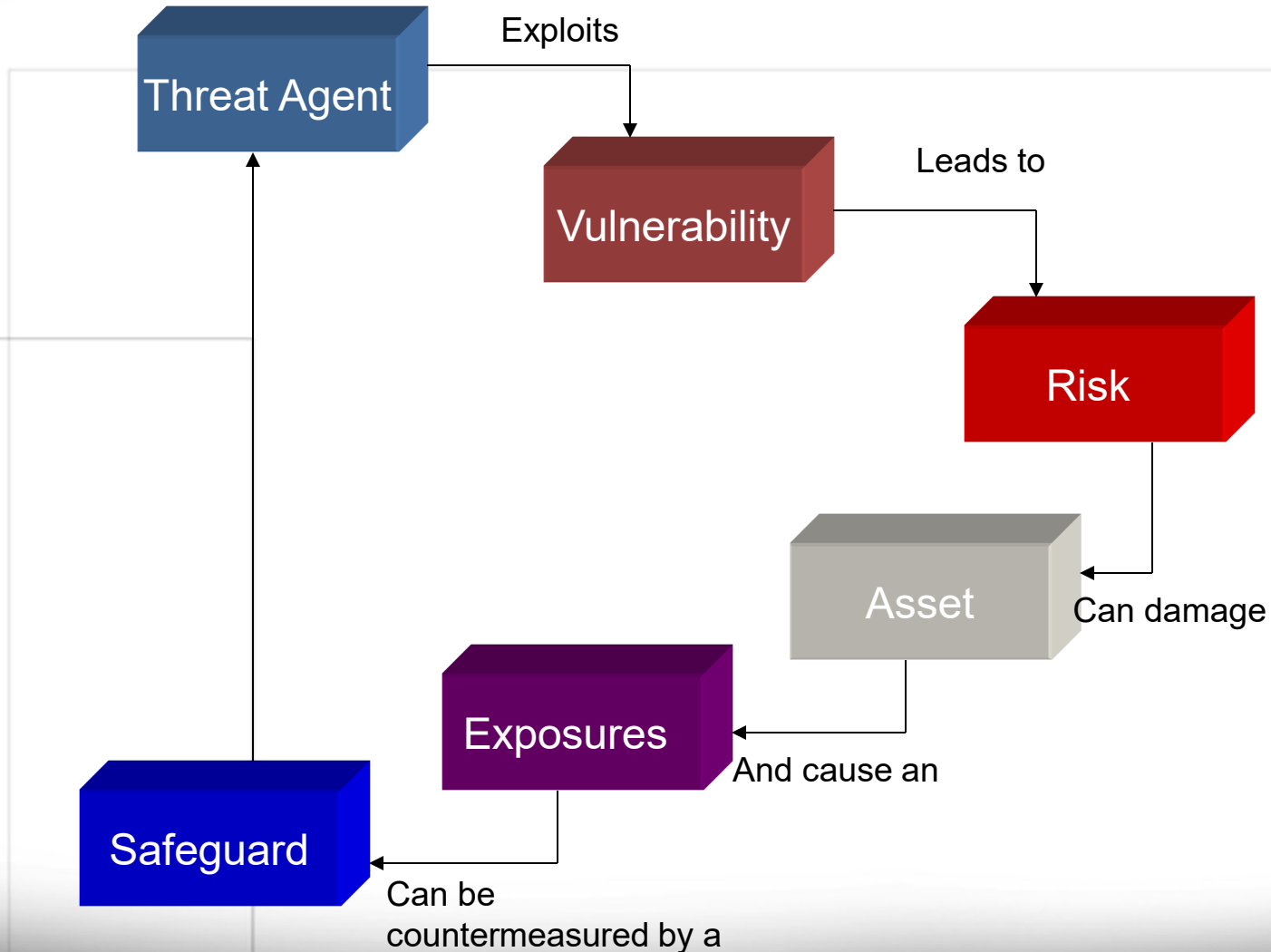
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What is Risk and how to measure it

- Risk is determined by the following factors
 - Assets (A)
 - Impact (I)
 - Threats (T)
 - Vulnerabilities (V)

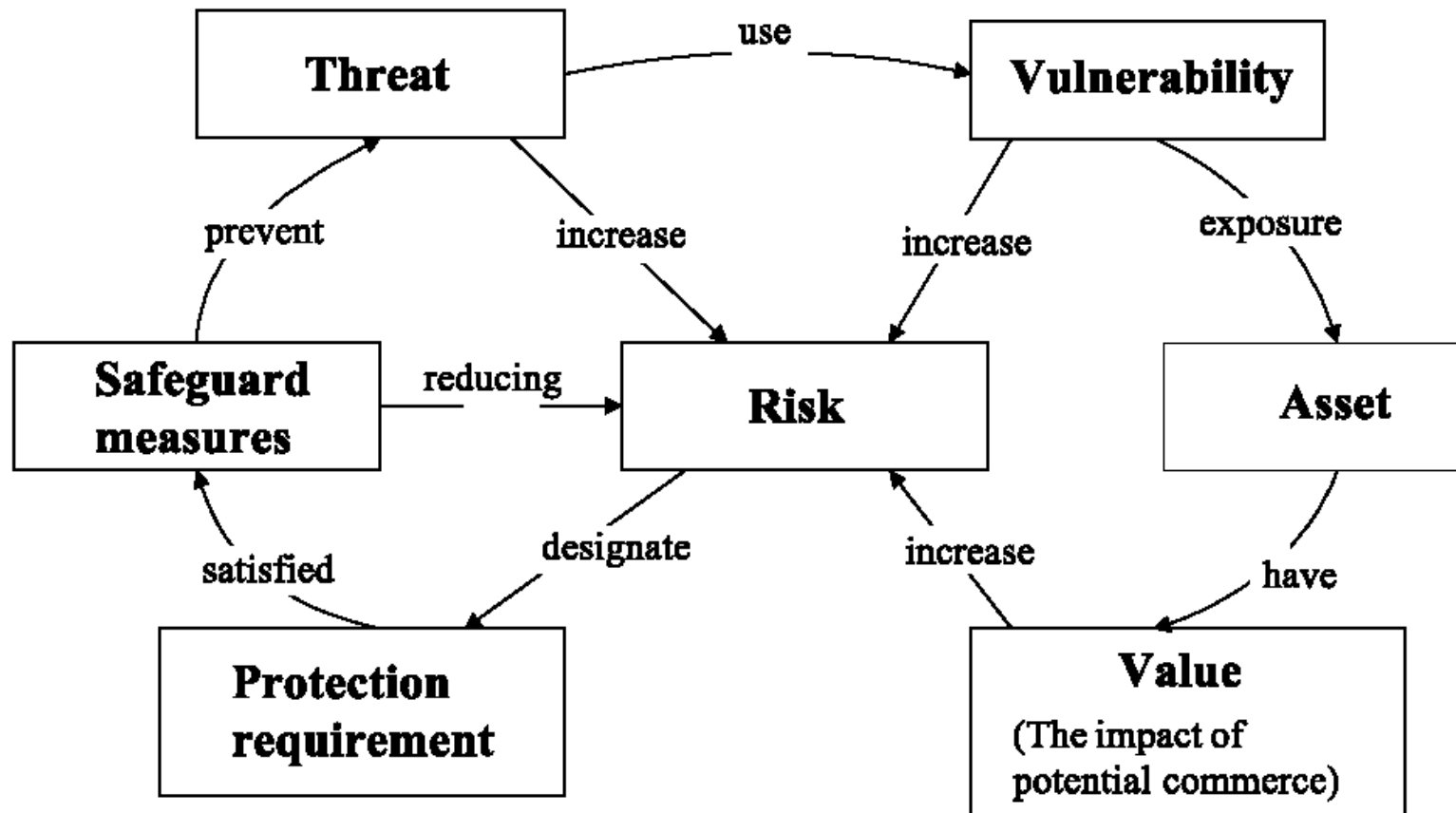
$$R = f(A, I, T, V)$$

Risk Life Cycle



Risk Analysis

Conceptualisation map of Information System



Risk Analysis

Basic Definitions

- **Assets**; what needs protection
- **Business impact** is the outcome of a failure to protect the assets of the IS.
- **Threat** is any action or event that may cause damage to an Information System.
- **Vulnerability** is a characteristic of the IS that may allow a threat to succeed.
- **Safeguard measures**- is the probability that a specific threat will successfully exploit a vulnerability causing a loss.
- **Protection Requirement** - Implementations to reduce overall risk and vulnerability

Risk Analysis

Assets

- **Assets:** Something that the agency values and has to protect. Assets include all information and supporting items that an agency requires to conduct business.
- **Data**
 - Breach of confidentiality
 - Loss of data integrity
 - Denial of service
 - Corruption of Applications
 - Disclosure of Data
- **Organization**
 - Loss of trust
 - Embarrassment
 - Management failure
- **Personnel**
 - Injury and death
 - Sickness
 - Loss of morale

Risk Analysis

Assets Cont'd

- **Infrastructure**
 - Electrical grid failure
 - Loss of power
 - Chemical leaks
 - Facilities & equipment
 - Communications
- **Legal**
 - Use or acceptance of unlicensed software
 - Disclosure of Client Secrets
- **Operational**
 - Interruption of services
 - Loss/Delay in Orders
 - Delay in Shipments

Risk Analysis

Vulnerabilities

- Vulnerabilities are flaws within an asset, such as an operating system, router, network, or application, which allows the asset to be exploited by a threat.
- Examples
 - Software design flaws
 - Software implementation errors
 - System misconfiguration (e.g. misconfigured firewalls)
 - Inadequate security policies
 - Poor system management
 - Lack of physical protections
 - Lack of employee training (e.g. passwords on post-it notes in drawers or under keyboards)

Risk Analysis

Threats

- Threats are potential causes of events which have a negative impact.
 - Threats exploit vulnerabilities causing impact to assets
- Examples
 - Denial of Service (DOS) Attacks
 - Spoofing and Masquerading
 - Malicious Code
 - Human Error
 - Insider Attacks
 - Intrusion

Risk Analysis

Sources of Threats

Source	Examples of Reasons
External Hackers with Malicious Intent	<ul style="list-style-type: none"> • Espionage • Intent to cause damage • Terrorism
External Hackers Seeking Thrill	<ul style="list-style-type: none"> • Popularity
Insiders with Malicious Intent	<ul style="list-style-type: none"> • Anger at company • Competition with co-worker(s)
Accidental Deletion of Files and Data	<ul style="list-style-type: none"> • User errors
Environmental Damage	<ul style="list-style-type: none"> • Floods • Earthquakes • Fires
Equipment and Hardware Failure	<ul style="list-style-type: none"> • Hard disk crashes

RISK TYPES

- What types of risk exist?
 - Physical Asset Risks
 - Mission Risks
 - Security Risks

Risk Analysis

Risk

- Risk is the probability that a specific *threat* will successfully exploit a *vulnerability* causing a *loss*.
- Risks of an organization are evaluated by three distinguishing characteristics:
 - loss associated with an event, e.g., disclosure of confidential data, lost time, and lost revenues.
 - likelihood that event will occur, i.e. probability of event occurrence
 - Degree that risk outcome can be influenced, i.e. controls that will influence the event
- Various forms of threats exist
- Different stakeholders have various perception of risk
- Several sources of threats exist simultaneously

Risk Analysis

Physical Asset Risks

- Physical Asset Risks
 - Relating to items with physical and tangible items that have an associated financial value

Risk Analysis

Mission Risks

- Mission Risks
 - Relating to functions, jobs or tasks that need to be performed

Risk Analysis

Security Risks

- Security Risks
 - Integrates with both asset and mission risks

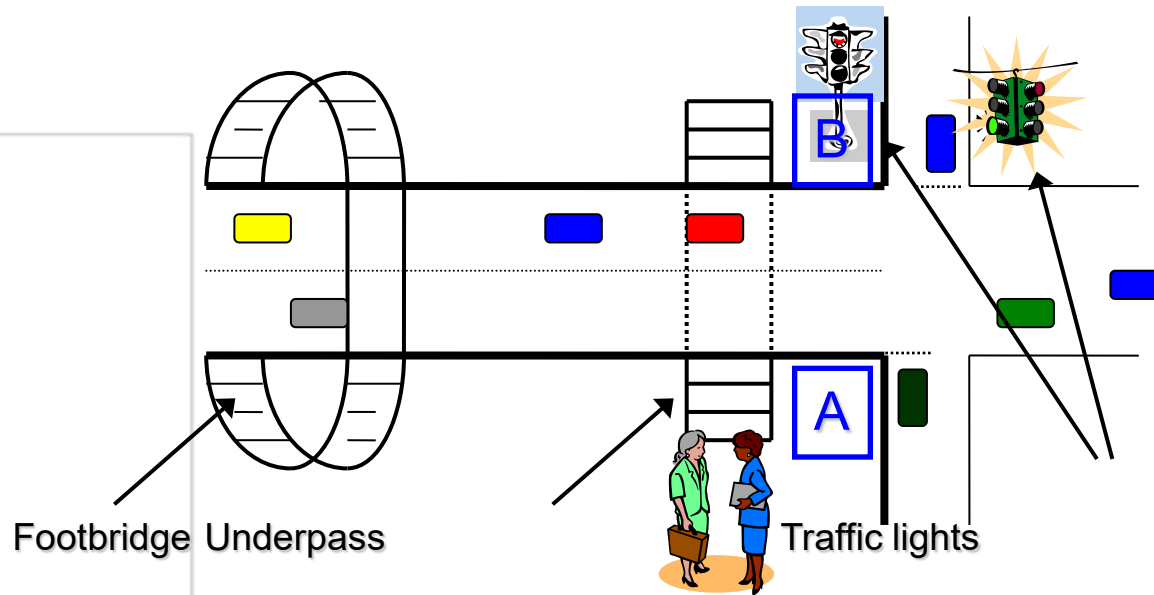
Difference

Risk Assessment vs. Risk Analysis vs. Risk Audit

	Assessment	Analysis	Audit
Objective	Baseline	Determine Exposure and Potential Loss	Measure against a Standard
Method	Various (including use of tools)	Various (including tools)	Audit Program/ Checklist
Deliverables	Gaps and Recommendations	Identification of Assets, Threats & Vulnerabilities	Audit Report
Performed by:	Internal or External	Internal or External	Auditors
Value	Focused Improvement	Preparation for Assessment	Compliance

- **EXERCISE**

Crossing the road



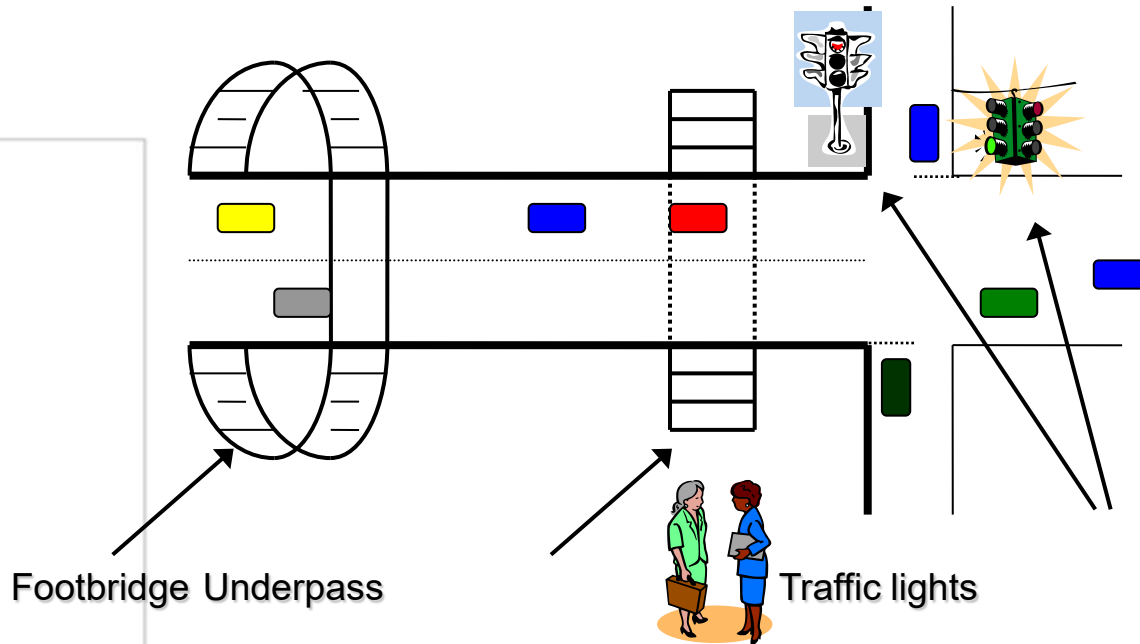
Summary of risk factors

- Physical attributes of pedestrians
- Speed of crossing road
- Daylight/night
- Threat of attack in underpass
- Distance to footbridge

Scenarios

- Elderly persons crossing in dry conditions (day)
- Male adult crossing in dry conditions (night)
- Parent/child with pushchair crossing in rain (day)

Crossing the road



Exercise - Tyre change

- Carry out a risk assessment on a tyre change.
- What are the hazards in changing a tyre?
- What controls can you use to reduce the risk?

What hazards are here?



What about this one?



Would you like to have to make the change
here?



Can it get worse?



- And worse?



Beautiful – but other hazards?



So how can we prepare
for the worst
– to make it better?

Warn others to protect yourself



A light can be helpful in dark conditions



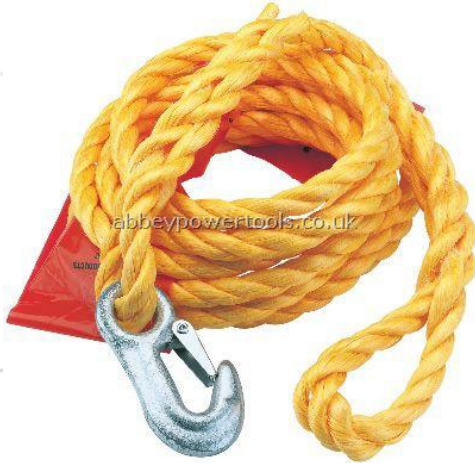
A jack is a must



- And you may consider axle supports



Other items are important



But remember our assessment options



Referensi

- Sanjay Goel, School of Business/Center for Information Forensics and Assurance, University at Albany Proprietary Information