
RISK ANALYSIS

DWS

POKOK BAHASAN

- **Risk Analysis:**
 - Qualitative
 - Quantitative
 - ROI
- **Process of Risk Analysis**

PERHITUNGAN

- **Analisa resiko (terkait disaster)**
 - **Single Loss Expectancy (SLE)**
 - **Annual Loss Expectancy (ALE)**

Qualitative Risk Analysis

- **The traditional computer security review has always tended to be subjective and to lean heavily towards the analyst's prejudices and areas of expert knowledge**
- **Qualitative Risk Analysis in the computer environment moves away from this and produces values that will allow a Board of Directors to see the impact of existing weaknesses in computer security and the seriousness of a given situation and the potential losses to the organisation**

Qualitative Risk Analysis

- In order to get an **overview of the risk exposure** it is usual to conduct a broad qualitative analysis first
- Instead of using detailed financial values to calculate the value of the actual event an **adjective is used**, where the adjective defines a range of values
- **Threat and Vulnerability Worksheet** is used

List of Worksheet

- **Vulnerability**
 - Describe the vulnerability is. Ex.: “Back-up”
- **Description of Vulnerability**
 - Detail of the vulnerability. Ex.: “There is no back-up the mainframe in the event of disaster”
- **Threat**
 - List of threat
- **Impact**
- **Frequency**
 - Statistical frequency of occurrence. Ex.: Aeroplane crash the statistical frequency of once in three hundred years

List of Worksheet

- **Annual Loss Expectancy (ALE)**

- Shown as an adjective so the analyst and management can get a "feel" for the problem
- An acceptable table of adjectives would be:

» Very Low	Up to £1,000
» Low	£1,000 to £ 10,000
» Low/Medium	£10,000 to £50,000
» Medium	£ 50,000 to £100,000
» Medium/High	£100,000 to £500,000
» High	£ 500,000 to £1,000,000

- In this instance "Low/Medium" could be selected indicating the loss would be in the region of £10,000 to £50,000 every year

List of Worksheet

- **Rationale**
 - Describe how the threats will come to fruition. For example: "There is no back-up machine and no disaster plan. A fire or deliberate act of sabotage will mean that the company cannot process its data"
- **Recommended Countermeasures**
 - All the countermeasures that will help to reduce the threat

ALE

- **ALE digunakan untuk mengetahui value dari utility yang digunakan dalam mereduksi disaster**
- **Good risk analysis programmes will provide reasonably accurate values for insurance purposes; the insurance later being reduced once the countermeasure is in place**

Quantitative Risk Analysis

- The principles that applied in the qualitative study still apply except the **impact must be quantified**
 - Ex.:If a Boeing crashes on an installation the loss will be the summation of hardware, software, recreation and consequential losses
- It is usually impossible to investigate and know absolutely the impact of frequency of any identifiable event especially **in the early stages of a study**
- By quantitatively analysis, monetary values can be applied to the "impact" to measure the cost effectiveness of counter measures

Quantitative Risk Analysis

- **Courtenay** argued that the SLE should be expressed in terms of units of currency and the frequency of the occurrence should be expressed on an annual basis:

SLE	=	£10 let $i = 1$	Once in 300 years,	let $f = 1$
		£100 let $i = 2$	Once in 30 years,	let $f = 2$
		£1,000 let $i = 3$	Once in 3 years,	let $f = 3$
		£10,000 let $i = 4$	3 times per year,	let $f = 4$
		£100,000 let $i = 5$	Once per week,	let $f = 5$
		£1,000,000 let $i = 6$	Once per day,	let $f = 6$
		£10,000,000 let $i = 7$	Once per 2 hours,	let $f = 7$
		£100,000,000 let $i = 8$	Once per 15 mins,	let $f = 8$

Quantitative Risk Analysis

- It follows that annual loss may be approximately equal to the SLE divided by the frequency of the event
- However, because the exact impact and frequency cannot usually be specified with total accuracy, it is possible to associate the ALE as a product of the estimated "SLE in monetary units" and the "estimated frequency of occurrence"
- $ALE = \frac{10^{(f+i-3)}}{3}$

Values of Frequency (f)

	1	2	3	4	5	6	7	8
1	*	*	*	*	£300	£3k	£30k	£300k
2	*	*	*	£300	£3k	£30k	£300k	£3m
3	*	*	£300	£3k	£30k	£300k	£3m	£30m
4	*	£300	£3k	£30k	£300k	£3m	£30m	£300m
5	£300	£3k	£30k	£300k	£3m	£30m	£300m	*
6	£3k	£30k	£300k	£3m	£30m	£300m	*	*
7	£30k	£300k	£3m	£30m	£300m	*	*	*

Intermezzo

4. IMPACT:

Modification of data for fraudulent ends £50,000. Public scandal; loss of business and capitalisation £1,000,000

5. FREQUENCY:

6. A.L.E.

ROI

- **The Return on Investment (ROI) represents the savings that can be expected from the countermeasure and is expressed as a ratio of total savings to cost of countermeasure**
- **Total Savings is the addition of the savings by threat/vulnerability that is affected by the countermeasure, since a countermeasure will often affect more than one threat**

ROI

- **Changes in the ALE will effect the ROI values**
- **To adjust for this effect it is advisable to select the most cost-effective countermeasure first**

RECOMMENDED COUNTERMEASURES:

1. Code and card reader locks to be installed on entrances as follows:

a) first floor access from reception

b) lift exits on all floors

c) fire escape doors on all floors to be alarmed

d) roof door to be alarmed.

2. Fire exits to be monitored by cctv.

3. Main door to be locked at weekends. Side door to be used as entrance and to have a code and card lock.

4. Computer room and surrounding areas to have code and card locks.

5. Identification badges to be worn by all staff and visitors.

6. Contractors to wear colour coded badges.

ROI

- This procedure is repeated for each countermeasure listed. All counter measures with a ROI of greater than 2:1 should be considered for implementation
- Less than 2:1 may be ineffective

3. ANNUAL COST: £10,200

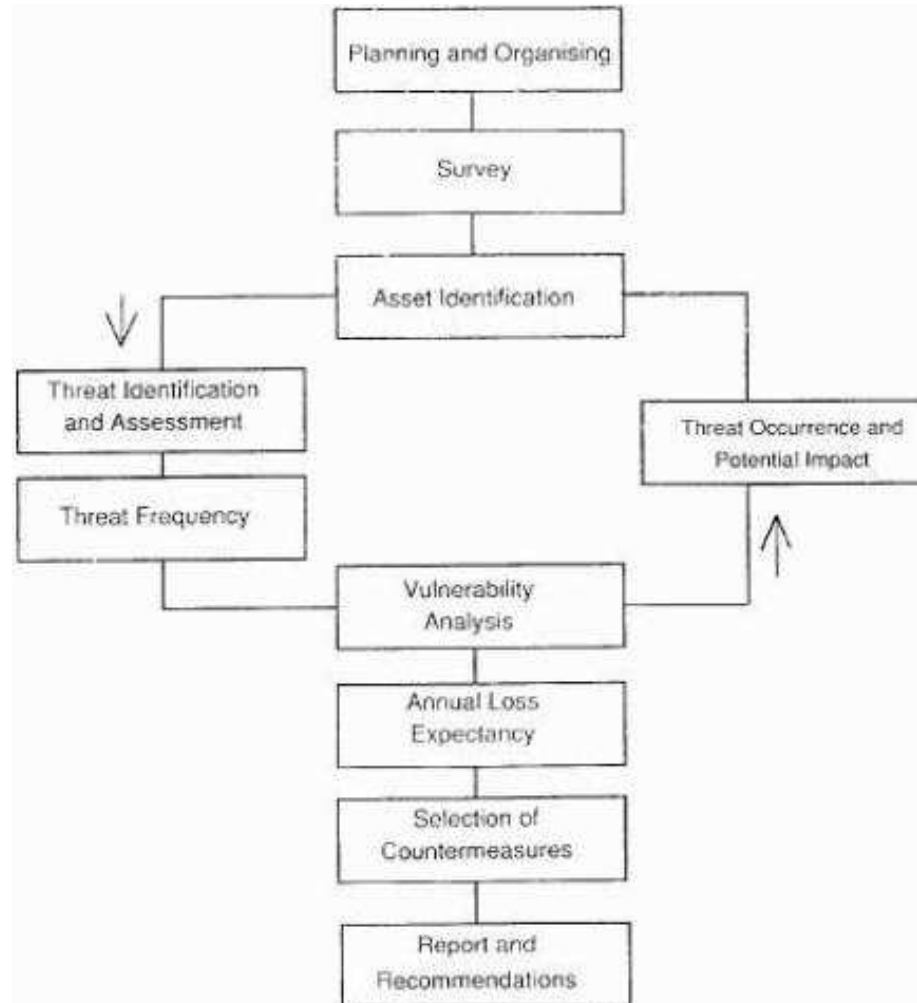
4. THREATS AFFECTED BY COUNTERMEASURE:

	ALE		
	CURRENT	PROJECTED	ALE SAVINGS
Disclosure of information	£200,000	£25,000	£175,000
Theft of property	£40,000	£8,000	£32,000

5. ROI: 20.29 : 1

TOTAL SAVINGS: £207,000

Process of Risk Analysis



TUGAS

- Analisa resiko menggunakan ALE dan SLE
- Contoh dokumentasi analisa resiko diberikan oleh instruktur
- Hitung ROI dari **selected countermeasure**
- Dikumpulkan selambat-lambatnya 2 pekan dari saat tugas ini diberikan



**SIAP
LAKSANAKAN !!!**





SELESAI