

# ROI for Security

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## What is it?

*For a given use of money, ROI calculates how much profits or saving you get from an investment.*

# Uses of ROI

- Companies
  - Assess the company's ability to earn an adequate rate or return (ROI, ROE)
  - Provide information about the effectiveness of the management (ROA)
  - Project future earnings
- Managers
  - Measure the performance of individual company segments when each is treated as an investment center
  - Evaluate capital expenditures and proposals
  - Assist in setting management goals for budgeting

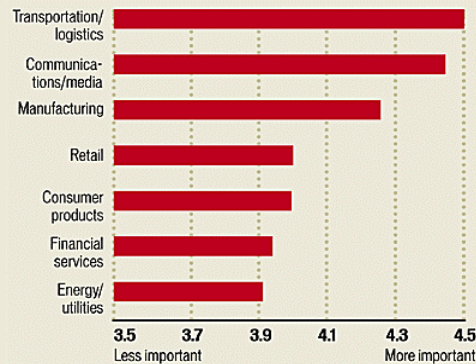
# Do you ROI?

- Does your management require ROI analysis?
- Do you have formal ROI policies or procedures?



## Importance of IT ROI, by Industry

*How important is financial justification, such as ROI, for securing internal funding for an IT project?*



**NOTE:** Respondents uses a scale of 1 to 5, with 1 being "not important" and 5 being "very important."

Source: survey of more than 100 IT decision-makers at Fortune 1,000 companies, conducted May to July 2002 by Ernst & Young LLP in New York.

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# Some Interesting Statistics

- Companies Want ROI
  - 45%\* of organizations now require some form of ROI
- But do they help you?
  - 68%\* of these companies DO NOT have formal ROI measurements
- Vendor ROI\*\*
  - 59% said they would prefer to receive vendor-supplied metrics
  - 2% of those polled said they have a "high degree" of trust in supplied metrics

\* Information Week

\*\* Ernst & Young

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# What it does and doesn't do?

- DOES

- A quantitative assessment of monetary return based on costs and benefits
- A key component to your business-case justification

- DOES NOT

- Provide you detailed Best Practices or Processes
- Evaluate vendor features
- Guarantee results

# Every Day Example

- Imagine buying 10,000 lottery tickets for \$10,000
- After several tense hours avoiding your significant other...
- You win \$1,000,000

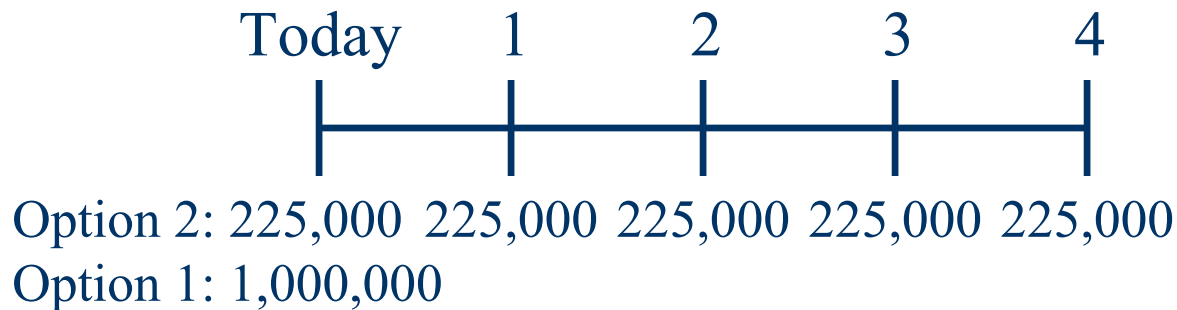
$$\text{ROI} = \frac{\text{Profit}}{\text{Investment}}$$

**Your ROI is 10,000%!!**



# Now or Later?

- Which option would you pick?
  - Option 1: \$1,000,000 today
  - Option 2: \$225,000 each year for 5 years





# Now or Later?

- Calculate the Present Value of \$225,000 payments today
- Money is affected by the following (*Discount Rate*):
  - Inflation
  - Risk of not getting the money
  - Interest that can be earned

$$\text{Present Value} = \frac{\text{FV}}{(1 + \text{DR})} + \frac{\text{FV}}{(1 + \text{DR})^2} + \dots$$

# Now or Later?

## Lottery Example

|                          |                 |               |               |               |               |  |
|--------------------------|-----------------|---------------|---------------|---------------|---------------|--|
| <b>Winnings:</b>         | \$ 1,000,000.00 |               |               |               |               |  |
| <b>Yearly Payment</b>    | \$ 225,000.00   |               |               |               |               |  |
| <b>Years</b>             | 5               |               |               |               |               |  |
| <b>Ticket Cost</b>       | \$ 10,000.00    |               |               |               |               |  |
| <b>Inflation</b>         | 3.5%            |               |               |               |               |  |
| <b>Risk</b>              | 0%              |               |               |               |               |  |
| <b>Interest rate</b>     | 7%              |               |               |               |               |  |
| <b>DISCOUNT Rate</b>     | 10.0%           |               |               |               |               |  |
|                          |                 |               |               |               |               |  |
|                          | Year 1          | Year 2        | Year 3        | Year 4        | Year 5        |  |
| <b>Payment</b>           | \$ 225,000.00   | \$ 225,000.00 | \$ 225,000.00 | \$ 225,000.00 | \$ 225,000.00 |  |
| <b>Value today</b>       | \$ 225,000.00   | \$204,545.45  | \$185,950.41  | \$169,045.83  | \$153,678.03  |  |
|                          |                 |               |               |               |               |  |
| <b>Present Value</b>     | \$ 938,219.73   |               |               |               |               |  |
| <b>Net Present Value</b> | \$ 928,219.73   |               |               |               |               |  |

**Excel Formula**  
NPV(DR, Benefit)

# Now Back at the Office...

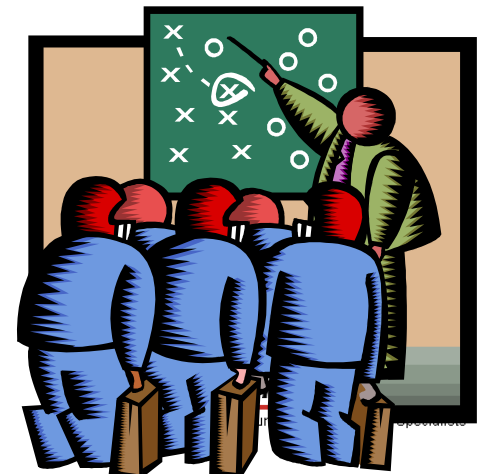
- In order to meet the needs of business, more detailed calculations are required:
  - Performance related
  - Detailed organizational costs(TCO) and benefits
  - Risk determination
- Benefits and Costs are harder to calculate:
  - Forecasted Estimates
  - Requires communication with multiple people(i.e. Delphi)
- Security estimations challenging:
  - Value of Equipment and Data
  - Estimated Exposure, Losses and Savings
  - Insurance impact



# The *Big Picture*

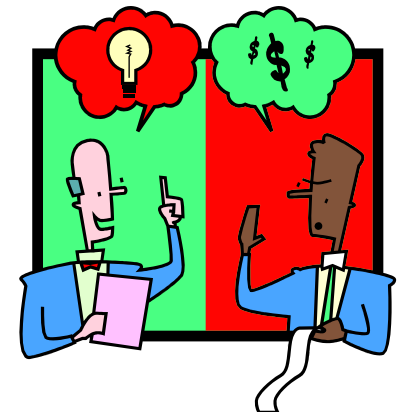
Perform the following for each product:

- 1. Calculate the Costs**
  - Computers, People, Expenses
- 2. Calculate the Benefits**
  - Direct
  - Indirect
- 3. Do the Financial Analysis**
  - Payback Period
  - Internal Rate of Return (IRR)
  - Net Present Value
  - Total Cost of Ownership
  - Annualized ROI



# Costs

- Software/Hardware expenses and depreciation
- Licenses/ASP charges (i.e. Production/Staging/Development) or ASP charges
- Additional Software i.e. Data base
- Maintenance fees
- Internal services (IT, Management)
- External services(Consulting)
- Training (course, facilities, trainer)
- Telephone, Travel, etc



# Benefits

- Direct
  - Business and IT employees reassigned
  - Reduced Consulting (i.e. Bring the services in-house)
  - Elimination of expenses (i.e. printing, cell phone etc.)
  - Reduced development and helpdesk costs
  - Reduced hardware and software maintenance costs
- Indirect
  - Additional employee productivity
  - Reduced Hiring (include recruiter fees)
  - Reduced Training and Administrative overhead
  - Reduced incidence calls and services
  - Annual Loss Expectancy Savings
  - Reduced Insurance Premiums

# Payback

- Description
  - How long will it take for the investment to show a profit (↓)

- Formula

$$\text{Payback} = \frac{\text{Initial Cost}}{\text{Annual net benefit}}$$

- Example
  - A \$10,000 IDS with a \$5,000 per year benefit has a payback of 2 years

# Internal Rate or Return

- Description:

- The percentage rate earned by product or service (↑).
- Often used to benchmark investment performance

- Formula

$$\text{Initial Costs} = \left( \frac{\text{Net Benefit Yr1}}{(1 + IRR)} + \frac{\text{Net Benefit Yr2}}{(1 + IRR)^2} + \dots \right)$$

- Example

| Internal Rate of Return |                |        |        |        |
|-------------------------|----------------|--------|--------|--------|
| IDS                     | \$ 10,000.00   |        |        |        |
| Yearly Benefit          | \$ 5,000.00    |        |        |        |
|                         |                |        |        |        |
|                         | Cost of IDS    | Year 1 | Year 2 | Year 3 |
| Benefit                 | \$ (10,000.00) | 5000   | 5000   | 5000   |
| IRR is:                 | 23%            |        |        |        |

**Excel Formula**  
IRR (Values)

# Net Present Value

- Description
  - Gives you a dollar value of your expected return today(↑)

- Formula

$$\text{Present Value} = \left( \frac{\text{FV1}}{(1 + \text{DR})} + \frac{\text{FV2}}{(1 + \text{DR})^2} + \dots \right) - \text{Initial Cost}$$

- Example

|                          |              |              |             |
|--------------------------|--------------|--------------|-------------|
| IDS Cost                 | \$ 10,000.00 |              |             |
| Yearly Benefit           | \$ 5,000.00  |              |             |
| Years                    | 3            |              |             |
| Inflation                | 3.5%         |              |             |
| Risk                     | 0%           |              |             |
| Interest rate            | 7%           |              |             |
| DISCOUNT Rate            | 10.0%        |              |             |
|                          | Year 1       | Year 2       | Year 3      |
| Benefit                  | \$ 5,000.00  | \$ 5,000.00  | \$ 5,000.00 |
| Value today              | \$ 5,000.00  | \$4,545.45   | \$4,132.23  |
| Value of payments Today: |              | \$ 13,677.69 |             |
| Net Present Value:       |              | \$ 3,677.69  |             |

**Excel Formula**  
NPV(DR, Benefit)

# Total Cost of Ownership

- Description
  - Total costs of owning a product
  - License, labor, HW, Maintenance upgrades etc.

- Formula

$$\text{TCO} = \text{S/W} + \text{H/W} + \text{Depreciation} + \text{Consulting} + \text{Personnel} + \text{Training}$$

- Example

- $\text{TCO} = \$10,000 + \$2,000 + \$5,000 + \$5,000 + \$500$
- $\text{TCO} = \$23,000$

# Annualized ROI

- Description:
  - Annual return on your dollars invested on a given task or object (↑)
- Formula

$$ROI = \left( \frac{\text{Net Benefit Yr1}}{(1 + DR)} + \frac{\text{Net Benefit Yr2}}{(1 + DR)} + \frac{\text{Net Benefit Yr3}}{(1 + DR)} \right) / \text{Initial Cost}$$

- Example

|                |              |             |              |             |  |      |
|----------------|--------------|-------------|--------------|-------------|--|------|
| IDS Cost       | \$ 10,000.00 |             |              |             |  |      |
| Yearly Benefit | \$ 5,000.00  |             |              |             |  |      |
| Discount Rate  | 10%          |             |              |             |  |      |
|                |              | Year 1      | Year 2       | Year 3      |  |      |
|                |              | \$ 4,545.45 | \$ 4,132.23  | \$ 3,756.57 |  | 124% |
|                |              |             | \$ 10,000.00 |             |  |      |

# But what about Security?

- Expenses are relatively easy to calculate, but countermeasure benefits are tough!
- Benefits can be:
  - Labor saving -- lower incidence response rate
  - Lower Insurance Rates
  - *Risk Assessment Savings*



# Assessing your Risks

- Risk Analysis

- Assign value to Information and Assets
- Estimate exposure factor
- Perform and derive potential costs and savings

- Calculate Risk Formulas\*

- Exposure Factor (EF)
- Single Loss Expectancy = Asset Value \* EF
- Annual Rate of Occurrence (ARO)
- Annualized Loss Expectancy = SLE \* ARO

- Value to organization is:

- ALE savings = ALE before – ALE after

|  |                |               |
|--|----------------|---------------|
| Asset Value(H/W, Proprietary software, DATA) | ▼              | \$ 100,000.00 |
| EF(Exposure Factor)                          | ▼              | 70%           |
| SLE(Single Loss Expectancy)                  | ▼ (Calculated) | \$ 70,000.00  |
| Annual Rate of Occurrence                    | ▼              | 2             |
| Annual Loss Expectancy(SLE*ARO)              | (Calculated)   | \$ 140,000.00 |
| Expected Savings because of the product      |                | 25%           |
| ALE Savings                                  | (Calculated)   | \$ 35,000.00  |

\* Examples simplified for presentation purposes

# Assessing your Risks

- Exposure Factor (EF) based on:
  1. Experience
  2. Qualitative Approach
  3. Delphi technique (Input by group)
  4. Industry research( i.e. NSS Study <http://www.nss.co.uk/> )
- Managing the Risk
  1. Transfer it – Buy Insurance
  2. Reduce risk – Implement countermeasure
  3. Reject it – Ignore it
  4. Accept it and live with it
- Web Resource
  - IDS ROI Example  
[online.securityfocus.com/infocus/1608](http://online.securityfocus.com/infocus/1608)



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# A Detailed Example

XYZ Ltd. needs to improve vulnerability security on a NEW customer/employee portal.

- **The Details:**

- Company Confidential data would be exposed if hacked
- Current security quarterly audit is not enough
- They have seen significant #s of break-in attempts

- **The Product**

- Automated Vulnerability Assessment tool

**“99% of intrusions result from exploitation of known vulnerabilities or configuration errors where countermeasures were available”**

Source: 2001 CERT, Carnegie Mellon University

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# Change the GAME

- Use Security to enable **Business**:
  - Leverage security to improve sales/support opportunities
  - Shifting the budget from Security/IT to Sales/Operations/HR
- Leverage vendor ROI models, but always validate
- Laws
  - Liability
    - Federal Sentencing Guidelines(*Prudent Man Rule*)
      - 1991 Corporate officers must institute protections(Pawn, Backups, etc.)
    - Communications Decency Bill
      - Protects companies from harassment lawsuits if checks put in place
  - Industry
    - Financial - Graham/Leach/Bliley
      - Regulates sharing of personal information
    - Medical - HIPPA
      - Regulates medical sharing of information

# How do I maximize ROI?

- Minimize costs:
  - Product price
  - Installation services (Consider ASP)
  - Training
  - Upgrade (installation, management, downtime)
  - Day to day management
- Maximize returns
  - Best Practice Efficiency
  - Customer impact(i.e. improved customer satisfaction)
- Monitor the product/service success
- Consider phased rollouts

# References and Resources

- ROI fundamentals whitepapers ([www.cioview.com](http://www.cioview.com))
- Analysis Firms(ie E&Y, Gartner)
- Security websites (cccure.org, csrc.nist.gov, cert.org)
- EF Statistics: <http://www.nss.co.uk/ids/index.htm>
- Information Week Survey:  
<http://www.informationweek.com/637/roi.htm>
- ROI Spreadsheets
  - [www.accelocity.com](http://www.accelocity.com) (FREE – ROI Resource pages)
  - [www.microsoft.com](http://www.microsoft.com) (FREE)
  - [www.businesscase.com](http://www.businesscase.com) (\$)
  - [www.mlnsoft.com/software/index.php](http://www.mlnsoft.com/software/index.php) (\$)

# Conclusion

- ROI is a key component in building your business case
- ROI can be calculated for Security products



**Interested in building  
a ROI library?**