# Creating Software

Waltzing with Bears

# Objectives

- Determine what is needed by the customer
- Determine the cost
- Make decisions accordingly

# Loser

- User
- Customer
- Developer
- Who loses
- VIP

| Solution | Loser |
| --- | --- |
| Quick Cheap | User |
| Feature loaded | Customer |
| Hard driven bargain | Develpoer |

# WIN WIN

- Success Critical Stakeholders
  - Value
  - Agreement on terms
- Negotiation
  - Adaptation
  - Utility
  - Decision
  - Control
- Realization – assure value
  - Delivered value
  - Monitored value

# Valuation

- Difficulties
  - Costs over time
  - Uncertainty
  - Additional training
  - Who determines value

# Cost Analysis

- Discounted cash flow
  - Time value of money
- Net present value
  - Calculated current value

# The Basic Math

- Sum the costs based on their percentage risk

$$\text{Best} * \% + \text{Avg} * \% + \text{Worst} * \% \ - \text{initial inv}$$
$$(1+\text{return }\%)^{\text{years}}$$

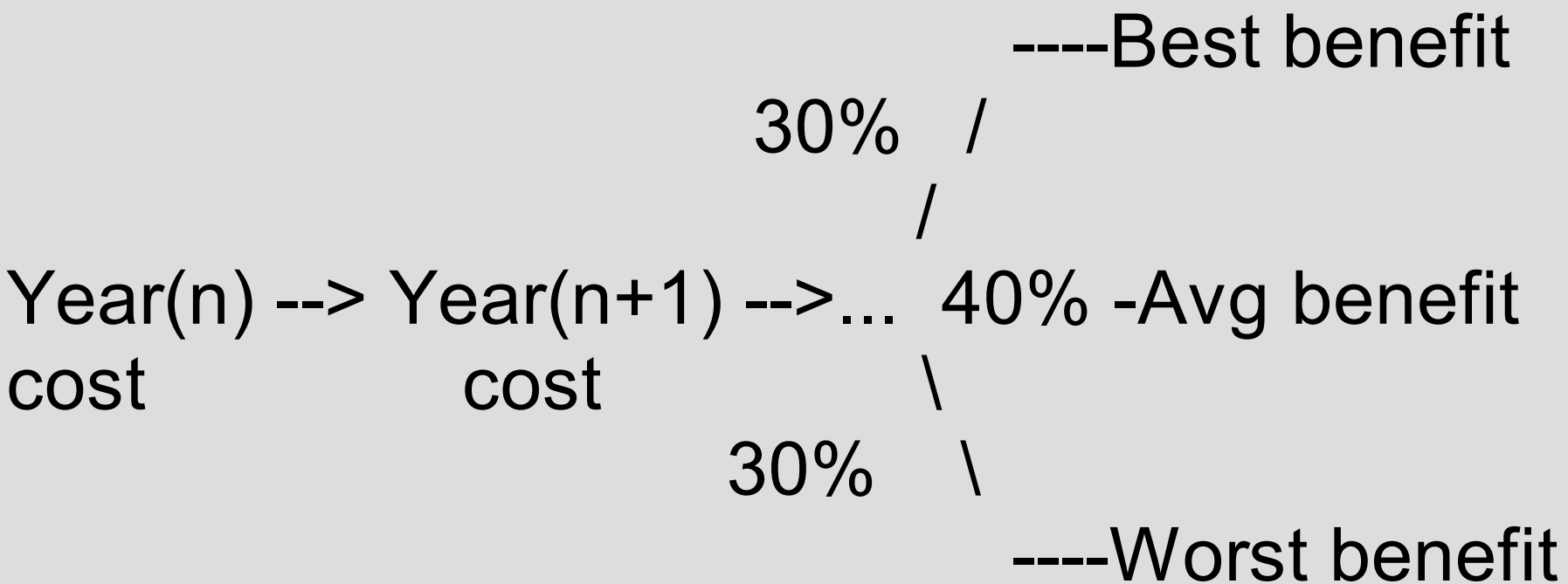
# Dynamic math

Initial Investments are not the only

-Year(n) cost (1-return%)^n  -Year(n+1) cost (1-return%)^n+1  .... + Basic Cost

Takes into account value of money

# Tree Representation



# Decision tree

- Each step estimated
- Decisions included
- Choices to cut and continue

# Real Options

- Money <> Time
  - Financial Risk reduced over time
- Limited Time
- Reserved price
- Price of using options
  - COTS

# Decisions - Risk in Mind

- Finite to infinite possibilities
- Account for multiple criteria
- SCS
  - Weighted
  - Aspirations
  - Outranking

# Additive

- Weights relative
- All equal via substitution
- Compromise

# MAUT & AHP

- Additive
- Qualitative
- Quantitative
- Abstract

# Analytical Hierarchy Process

- Hierarchical decisions
- Divided goals smaller decisions
- Usually about 4 levels
- Weighted

# Multi-Attribute Utility Theory

- Removes outliers
- Takes into account combined requirements
- Upgrade on basic additive theory

# Goal Based

- Goal or aspiration
- Evolving
- Decision or Reference points
- Goal vectors

# Outranking

- One step further
- Dominating factors
- Each path must be better than the last

# Questions