

A central blue circle containing a lighthouse image. The text "Project Risk Management" is overlaid in white. Surrounding this are concentric green circles and a network of teal and yellow nodes connected by lines.

# Project Risk Management

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Total Number of slides = 59

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## MODULE OBJECTIVES

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Plan risk  
management

Key Concepts  
of Risk

Risk  
Assessment

Risk Control

Apply the  
techniques to  
identify,  
assess and  
control risks

# Key Concepts in Project Risk Management

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- + *Characteristics of Risks*
- + *Risk Management Model*
- + *Risk Management and the Life Cycle*

01

# CONCEPTS

**Project Risk** – *an uncertain event or condition that, if it occurs, has a positive or negative effect (opportunities or threats) on one or more project objectives such as scope, schedule, cost and quality.*

Uncertainty : It may or may not occur

Probability : How likely is it to occur?

Impact : A loss or gain

Mitigation : Measures taken to overcome or exploit the effects

*Known risks – identified and planned response.* If it cannot be managed proactively – assign a contingency reserve

*Unknown risks – assign a management reserve*

# CONCEPTS

*Risk Attitude - How much risk are organizations and stakeholders willing to accept ?*

Risk appetite : uncertainty vs reward

Risk tolerance : amount of risk that willing to be withstood

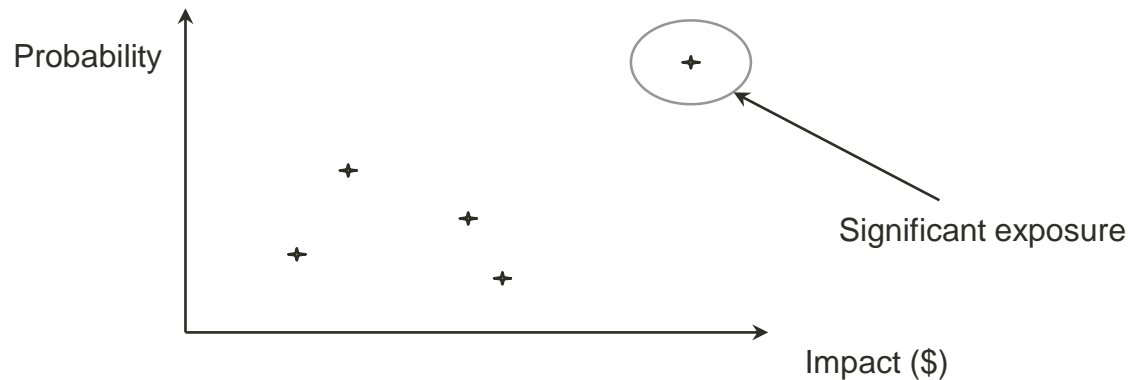
Risk threshold : level of uncertainty or impact , below which the risk is accepted above which it is rejected

# CONCEPTS

$$\text{Risk exposure (event)} = \text{Prob (event)} * \text{Impact (event)}$$

Given a 0.1% chance my home will catch fire and a loss of \$350,000 then my exposure is \$350

*This is what I may pay as insurance against this risk*



*In Risk management we focus on those events with significant exposures*

Bookmakers and insurance agents are normally very good at calculating risk exposure. However gamblers and software project managers are somewhat less so! WHY IS THAT SO?

# WHAT IS RISK MANAGEMENT?

## *Decision making under conditions of uncertainty*

Making informed decisions by consciously assessing what can go wrong and the resulting impact. It is identification, communication and resolution

### *Purpose*

Preventing risks from becoming a problem or lessen it's impact that threatens the success of the project

### *Benefits*

#### Controlling Risks

Reduce project cost and project vulnerability

Risk Visibility

Prompt Risk reaction

Risk prevention/risk exploitation

Confidence that something is being done about Risks

# PLAN RISK MANAGEMENT

*Define how to conduct risk management activities for the project*

## Components of the plan

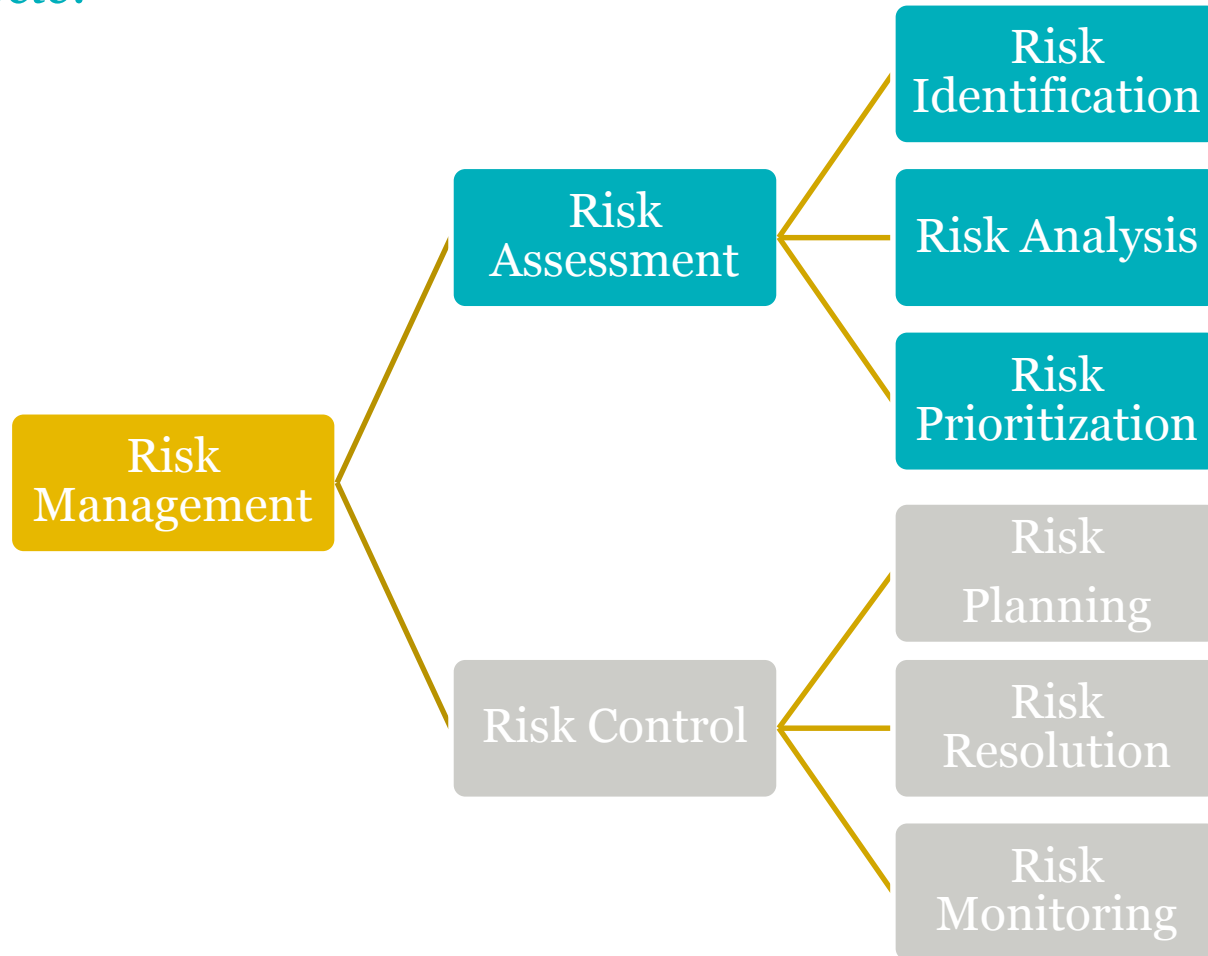
Methodology	<i>Approach, tools data sources to perform risk management</i>
Roles and responsibilities	<i>Team members to lead, support each type of activity</i>
Budgeting	<i>Estimated funding for inclusion in cost baselines</i>
Timing	<i>When and how often risk management processes will be performed, protocols for threshold and use of reserves</i>
Risk Categories	<i>Grouping of potential risks eg. Risk Breakdown Structure</i>
Definitions of risk probability and impact	<i>Definitions tailored to the specific project</i>

Methodology – approach, tools, data sources used for risk management



# RISK MANAGEMENT MODEL

*It's a cycle!*



# WHEN SHOULD RISK MANAGEMENT HAPPEN?

*Throughout the life of the project*

## Pre-implementation/ Feasibility stage

Forecasting of Risks

Qualitative assessment of Risks

Sometimes quantification

Identification of Risk resolution activities

Minimization of Risks in writing proposal

Go/No-go decision

## Implementation

Identification of Risks

Quantification of Risks and resolution activities

Risk management planning

Risk monitoring

Active Risk resolution

## Post implementation/ Support/ Maintenance/ Enhancement

Recording/Learning /Sharing experiences

Continuing Risk resolution

# Risk Assessment

- 
- + *What problems might occur? - IDENTIFICATION*
  - + *What impact will they have ? - ANALYSIS*
  - + *Which are the most critical? - PRIORITIZATION*

02

# RISK IDENTIFICATION TECHNIQUES

*Risk Identification helps team to anticipate events*

*Assumption  
Analysis*

*Documentation  
Reviews*

*Information  
Gathering  
Techniques*

*Decomposition  
and tasks  
dependencies*

*Checklists  
Analysis*

*SWOT Analysis*

*Diagramming  
techniques*

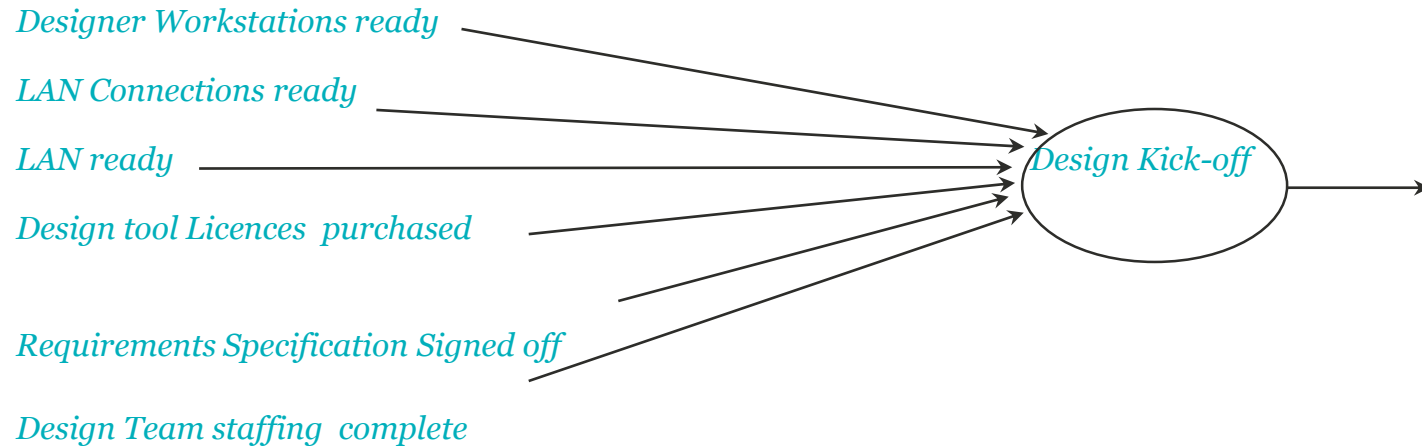
*Look at novelty items*

*Expert Judgement*

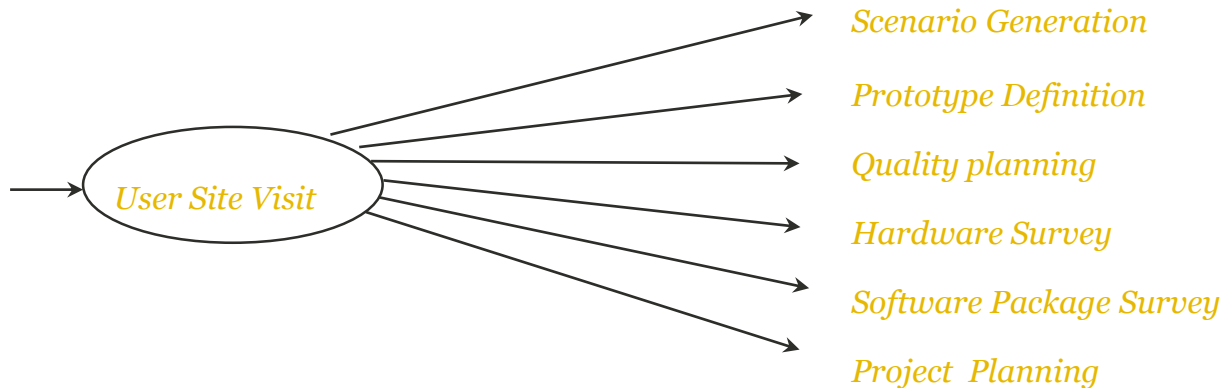
# TASK DEPENDENCIES

*HIGH FAN-IN : ANYTHING SLIPS*

*PROJECT HELD UP*



*HIGH FAN-OUT : PRECONDITION SLIPS EVERYTHING SLIPS*



# BARRY BOEHM'S CHECKLIST –APPROPRIATE FOR CONVENTIONAL PROJECTS

## General

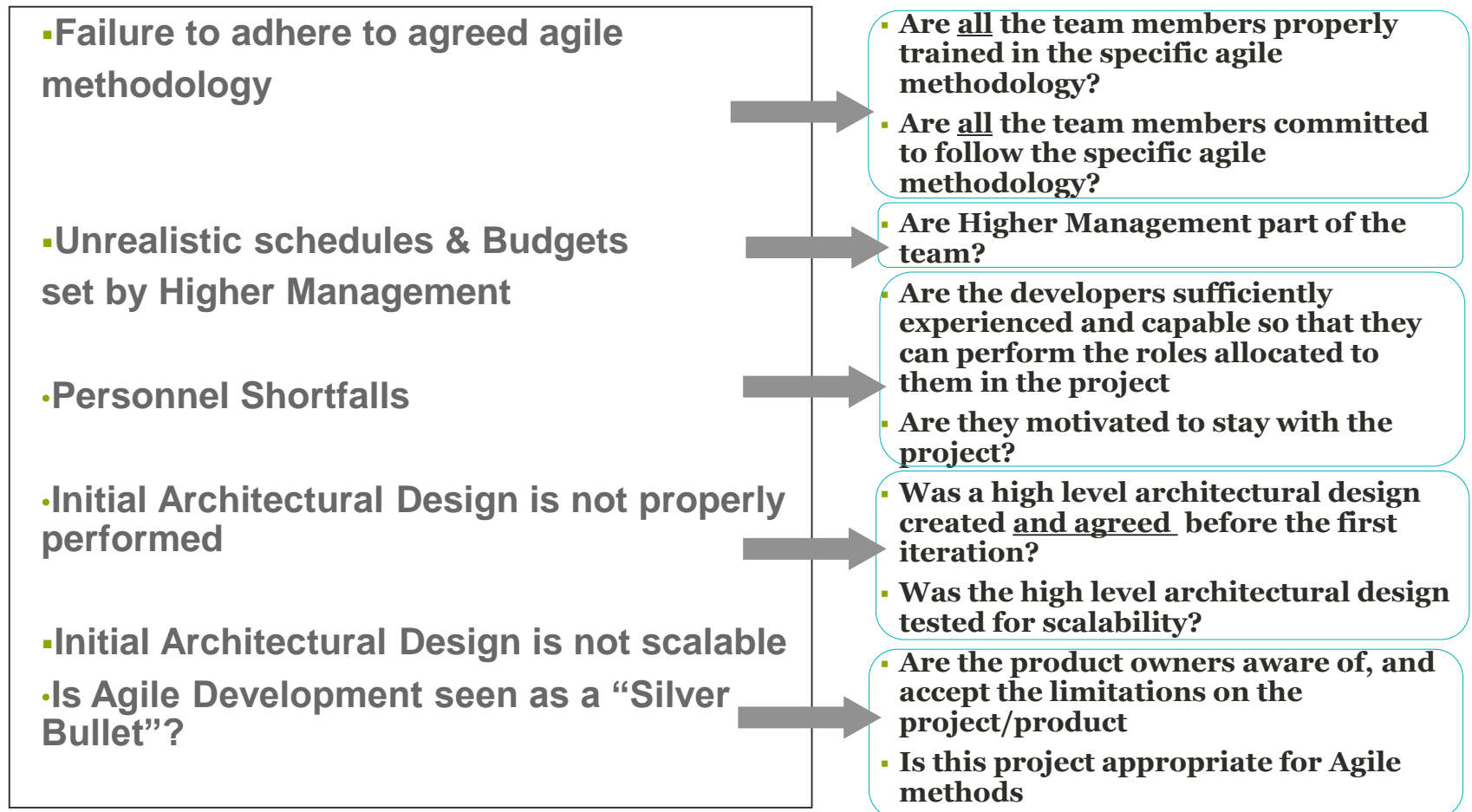
- Personnel Shortfalls
- Unrealistic schedules & Budgets
- Developing the wrong Software Functions
- Developing the wrong User Interface
- Gold Plating
- Rapid flow of Requirements changes
- Shortfalls in externally supplied components
- Shortfalls in externally implemented tasks
- Real time performance shortfalls
- Straining computer science capabilities

## Detailed

- *Will your project really get all the best people?*
- *Are there critical skills for which nobody is identified ?*
- *Are their pressures to staff with available warm bodies?*
- *Are their pressures to over-staff in the early phases?*
- *Are the key project people compatible?*
- *Do they have realistic expectations about their project job*
- *Do their strengths match their assignments?*
- *Are they committed for the duration of the Project?*
- *Are they committed full time?*
- *Are their task prerequisites (clearance, work-permits etc.) satisfied?*

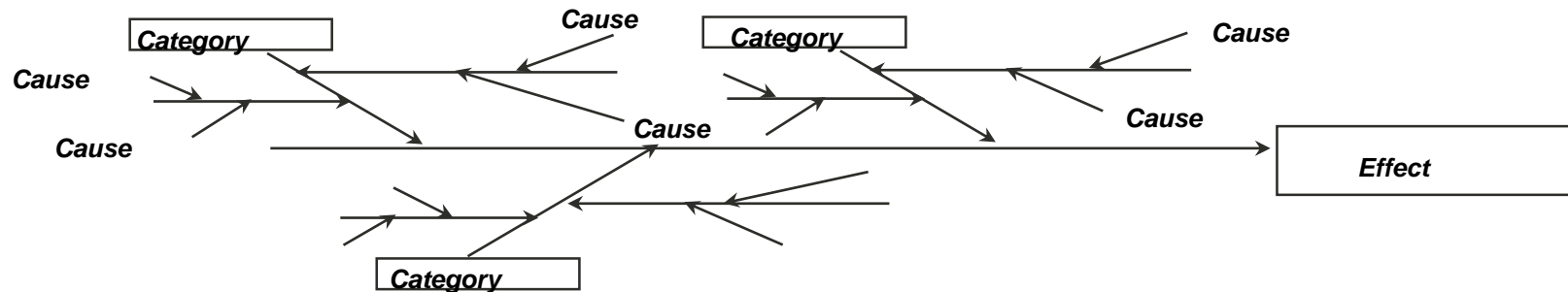
Software Risk Management : Barry Boehm 1986

# A RISK CHECKLIST FOR AGILE PROJECTS





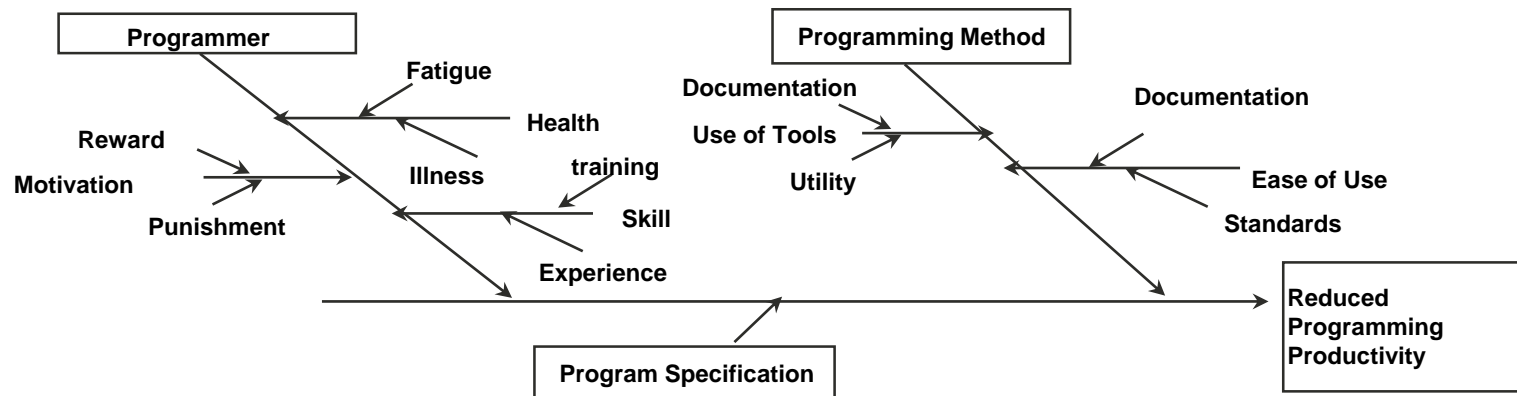
# DISPLAYING RISK INFORMATION: CAUSE AND EFFECT DIAGRAMS



*Useful for categorizing Risk*

*Useful for identifying common causes*

*Example: Risk of reduced productivity in software coding phase*





# RISK REGISTER

*Contains list of identified risks, the analysis and the response.*

- Identified risks - Describe in as much detail as reasonable.
- Structure : Event, caused by, leading to Effect
- Eg. Project team can't meet due to no common free time slots hence would not be able to meet scheduled milestones
- Eg. Key programmer leave the project, migrating to US after marriage, shortfall of critical programming skills, would likely lead to a delay in the development phase and the overall project.
- Eg. Late hardware delivery, due to flooding, might result in re-planning or possible delays
- Identify risks that are associated with using Beta versions of software.

# RISK ANALYSIS: DETERMINING RISK EXPOSURE

$$\text{Risk Exposure (event)} = \text{Prob(event)} * \text{Impact(event)}$$

*In order to determine exposure and hence prioritise risks , we need to determine probability and impact*

*Determining Impact may not be easy during initiation*

*Determining Probability may be very difficult*

*May use qualitative analysis*

*Questionnaires*

*Scoring & ranking*

*Quantitative analysis will give clearer picture if information is available*

*Project leader may have to make judgments*

# QUALITATIVE ANALYSIS : SIMPLE RISK CHECKLISTS

*Simple Yes/no Risk checklists can not only identify Risks but can also quantify Risks*

## Question

Less Risk

More Risk

### Project Management

*Are clear Project Objectives established?*

*Yes*

*No*

*Are project reviews held at appropriate intervals ?*

*Yes*

*No*

*Has the Project manager managed similar projects in the past?*

*Yes*

*No*

.....

### Development Environment

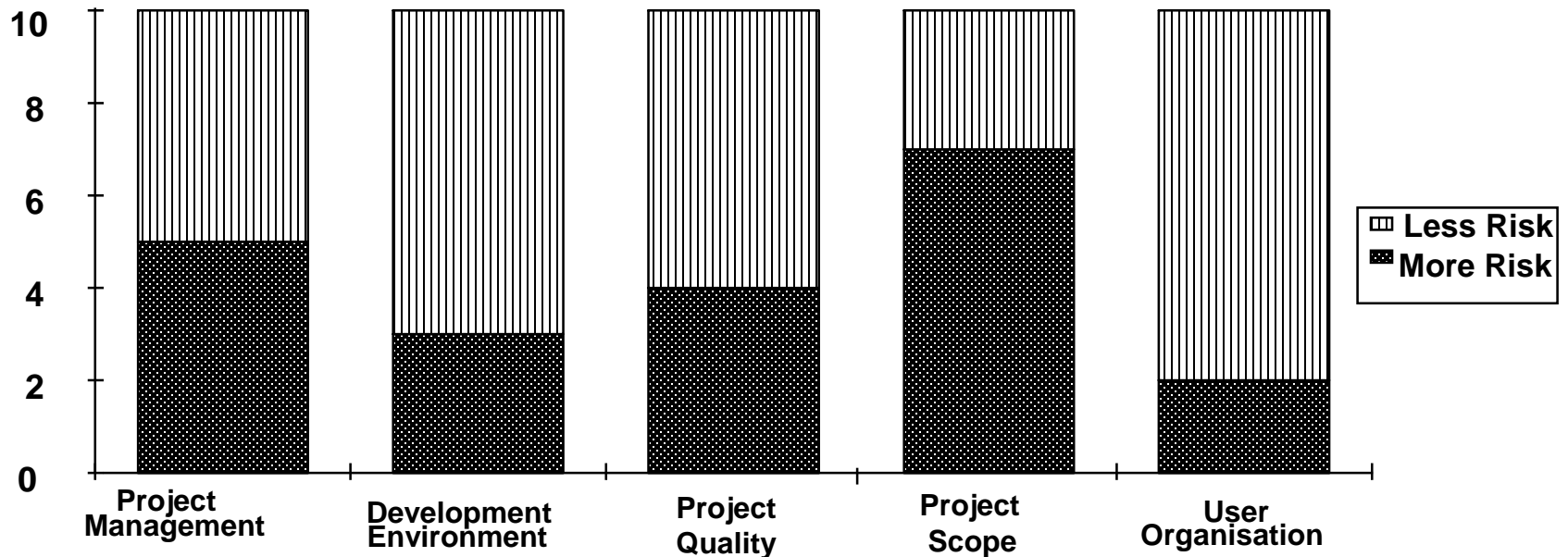
*Is a well defined development methodology being used?*

*Has the programming language been used on previous projects*

*Risk Management for Software projects ,1994, Down, Coleman& Absolon*

# SIMPLE RISK CHECKLISTS

*Simply add up the number of less Risk/more Risks*



*Risk Management for Software Projects ,1994, Down, Coleman& Absolon*

# A USEFUL RISK MANAGEMENT TOOL:

## *The Risk Assessment Questionnaire*

*Essentially span all features of Risk assessment*

*Incorporates*

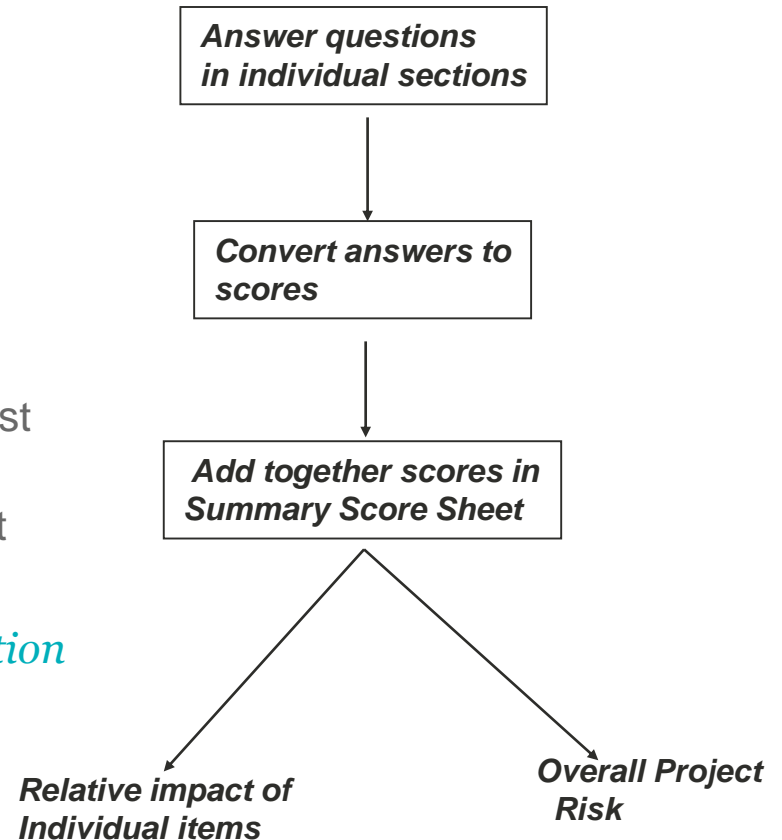
Check-list  
Assessment procedure

*Supports prioritization*

Project options with the highest score are most risky  
Sections within the questionnaire with highest score are the most risky parts of the project

*Especially suitable for high level proposal evaluation*

*Doesn't identify or assess all Risks*



# RISK SCORING TECHNIQUE

*Tries to evaluate impact severity and likelihood by scoring against criteria*

Risk Item	Impact					Likelihood				
	1	2	3	4	TOTAL IMPACT SCORE	1	2	3	4	TOTAL LIKELIHOOD SCORE
1. Late Hardware Delivery		√	√		2		√			1
2. Excessive staff turnover		√	√		2		√	√		2

## STEPS :

1. Identify risk items for each project option
2. For each Risk item identified, ask the questions below and tick if the answer is yes.
3. When complete, look at each Risk area and add up the number of ticks in the Impact and total likelihood columns respectively

*The output from this exercise will be a rating of impact and likelihood:  
( impact score, likelihood score) for each Risk item belonging to each project option*

*Risk Management for Software Projects ,1994, Down, Coleman& Absolon*

# DETERMINING IMPACT AND LIKELIHOOD : QUESTIONS ?

Impact	Probability
<b>1. Customer Cost</b>	<b>1. Novelty</b>
Will this Risk result in reduced systems performance or reduced functionality causing long term costs to the user, either by Business losses or Costs of system replacement	Does the Risk item involve new technology or techniques that have not been used before by the development organization?
<b>2. Internal Cost</b>	<b>2. Product History</b>
Will this Risk item have a high impact on the remainder of the project in terms of cost overrun	has this Risk item occurred in projects where similar products/earlier versions of this product were constructed ?
<b>3. Time to market costs</b>	<b>3. Recognized Authority</b>
Will this Risk item have a high impact on the time-to-market in terms of schedule slippage?	Is this currently recognized as a likely Risk by authorities or specialists in this field?
<b>4. Quality Costs</b>	<b>4. Expectation</b>
Will this Risk result in a low quality product which will in turn lead to high maintenance costs and significant down-times?	Has a clear and credible idea/plan/model for combating this Risk item been <i>identified</i> and <i>agreed</i> ?

*Risk Management for Software Projects ,1994, Down, Coleman& Absolon*

# USING RISK SCORING

*Determining the relative impact of risks. For each risk item we can calculate*  
*risk item score =  $\sqrt[3]{(\text{impact score})^2 + (\text{likelihood score})^2}$*

Example: two risks may affect the project ;

	Impact	Likelihood	Overall Score
Loss of experience staff	1	3	3.16
Late Hardware Delivery	2	2	2.82

*Which is the bigger risk?*

Exploring various project development/management strategies

*Suppose we have two development/management options for a project*

*Option 1; which has two risks associated with it ; Risk A and Risk B*

*Option 2; which has one risk associated with it ; Risk C*

*Suppose the risk item scores are;*

		Impact	Likelihood	Overall Score
Option 1	Risk A	1	2	3.16
Option 1	Risk B	2	3	2.82
Option 2	Risk C	3	3	4.24

*option risk score =  $\sqrt[3]{\sum(\text{risk items scores for that option})}$ . Which is the “better” option?*



# QUANTITATIVE ANALYSIS: CONSEQUENCE ANALYSIS

*What happens if the risk occurs?*

## Impact

Repeating/re-working tasks

“Freezing” other tasks

“Overheads”

Liquidated damages paid to client

Lost market opportunities

Financial costs

## *Example*

*For a major systems development one of the major subsystems fails systems tests and major re-work is necessary, a delay of two months in project schedule is created*

*Cost is*

Re-design/Re-code/Re-test subsystem : S\$10,000

Extra costs of staff on following tasks : S\$20,000

Overheads for extra two months : S\$20,000

Damages to client for not meeting deadline: S\$30,000

Extra interest on loan secured to finance contract: S\$10,000

*Total cost = S\$90,000*

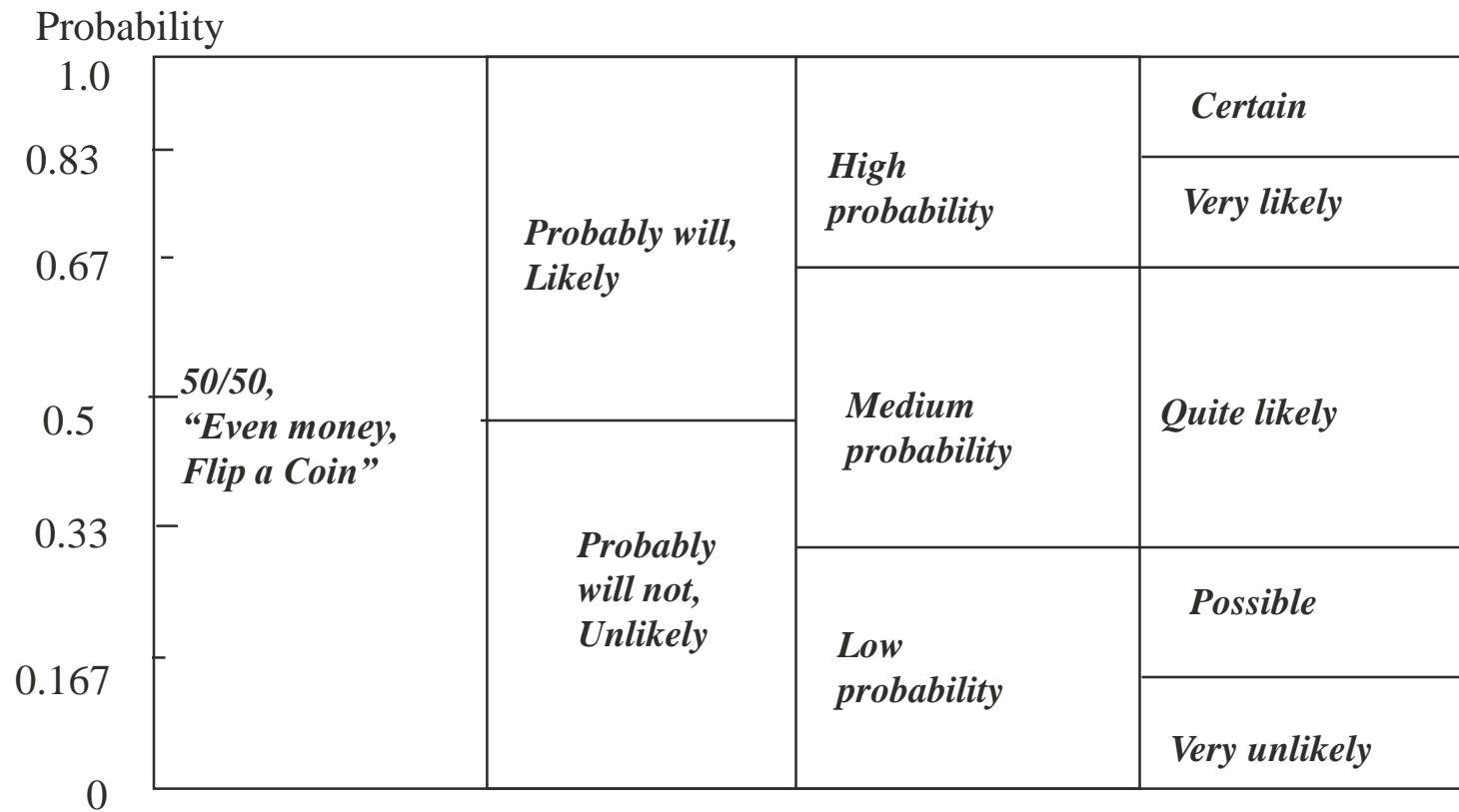
# EXPERT JUDGMENT - THE DELPHI TECHNIQUE

1. Get group of experts together with a monitor
2. Distribute copies of specification
3. Experts discuss specification & possible risks at a group meeting
4. Experts fill out forms where they determine probabilities of risks occurring separately
5. Monitor prepares a summary of the probabilities
6. Probabilities are discussed at a further group meeting – focus on variation
7. Experts fill out further forms detailing probability of risks occurring separately

*Steps 4 to 7 are repeated until there is “broad” agreement on probabilities*

# ADJECTIVAL CALIBRATION

*What qualitative descriptions mean to different people*



# IMPACT/PROBABILITY MATRIX

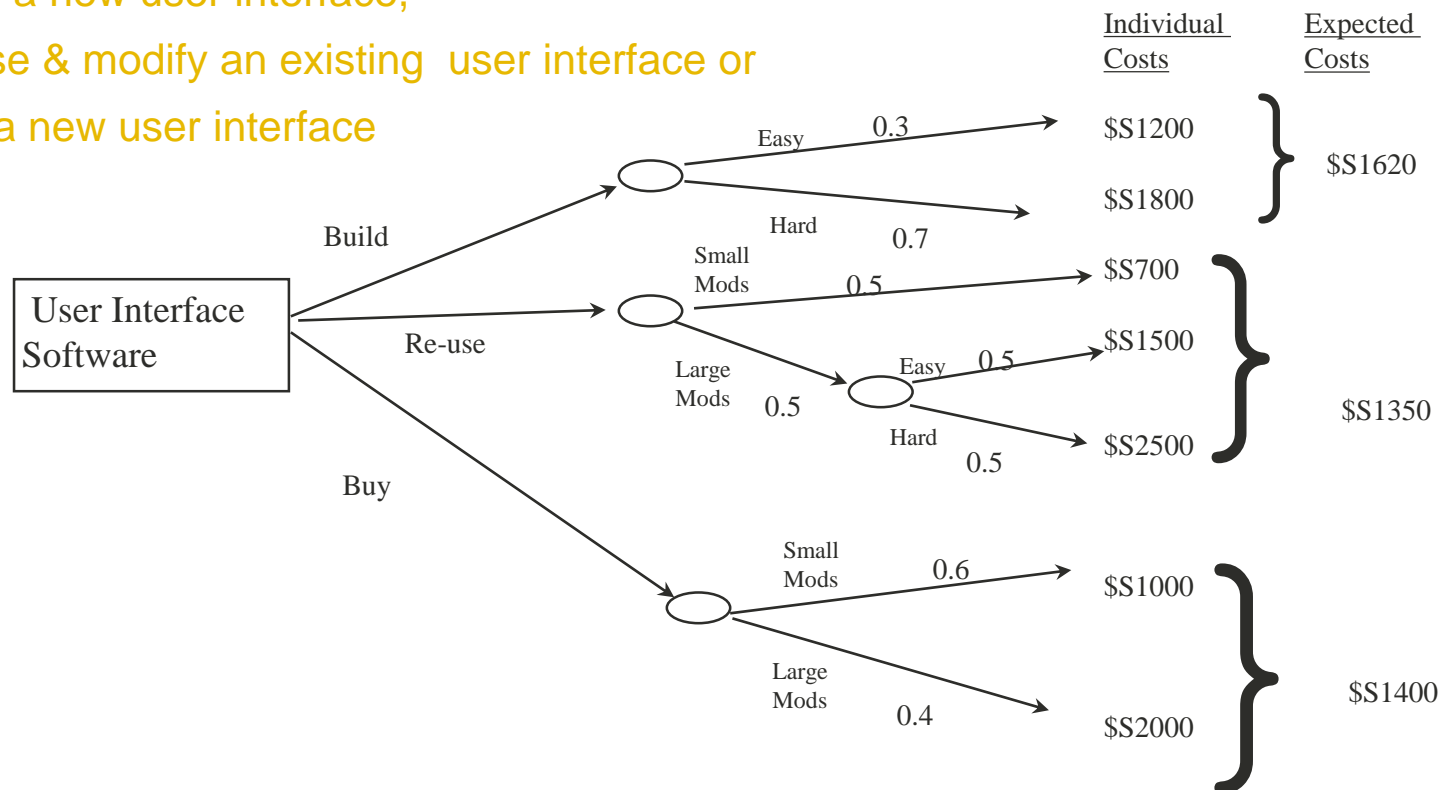
		Probability				
		Very High(0.90)	High (0.70)	Medium (0.50)	Low (0.30)	Very Low (0.10)
Impact	Catastrophic (0.80)	High	High	High	Moderate	Low
	Critical(0.60)	High	High	Moderate	Low	None
	Marginal(0.30)	Moderate	Moderate	Low	None	None
	Negligible (0.10)	Moderate	Low	Low	None	None

# RISK ANALYSIS -DECISION ANALYSIS

*Some risks will depend on decisions made in the project. Decision tree analysis can be used to examine consequence of decision.*

Example : decision on whether to :

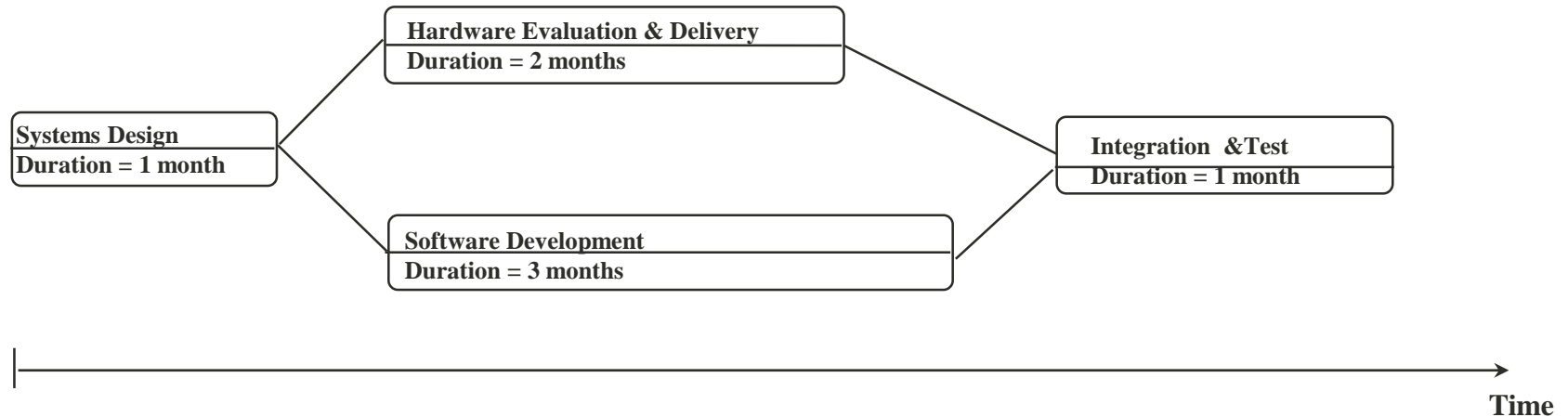
- Build a new user interface,
- Reuse & modify an existing user interface or
- Buy a new user interface



**Expected cost of Build option =  $0.3 * \$1200 + 0.7 * \$1800 = \$1620$**

# EXAMPLE OF OVERALL RISK ANALYSIS - I

*Suppose we have two Risks for a project;*



*Risk of late Hardware delivery, leading to slippage in the Hardware evaluation and delivery task*

*Risk of key person leaving software development leading to slippage in the Software development task*

# EXAMPLE OF OVERALL RISK ANALYSIS - II

*The probabilities and impacts associated with each are as follows*

Event	Impact	Probability
Hardware delivery on time	Hardware Evaluation/Delivery does not slip	0.5
Hardware delivery is late	Hardware Evaluation/Delivery slips by 1 month	0.2
	Hardware Evaluation/Delivery slips by 2month	0.2
	Hardware Evaluation/Delivery slips by 3 month	0.1
Key Software person stays	Software development does not slip	0.8
Key Software person leaves	Software development delayed by 2 month	0.2

*The cost impact of slippage in the total project duration is as follows:*

Event	Cost impact
Project delayed by 1 month	\$1,000
Project Delayed by 2 or months	\$10,000

*What are the risk exposures of each of these risks?*

*What is the total risk exposure?*

# EXAMPLE OF OVERALL RISK ASSESSMENT - III

## *Risk exposure of late hardware delivery*

There is a float of one month associated with activity “Hardware evaluation & delivery”

*Therefore if we are only concerned with the costs of extending total project duration then we are only concerned with hardware delivery slipping by two months or more*

Probability of slippage of hardware evaluation & delivery of 2 months = Probability of slippage of total project of 1 month = 0.2

Probability of slippage of hardware evaluation & delivery of 3 months = Probability of slippage of total project of 2 month = 0.1

*Therefore Risk exposure =  $0.2 \times 1000 + 0.1 \times 10,000 = \$S1,200$*

## *Risk exposure of key person associated with software development*

This is on the “critical path”

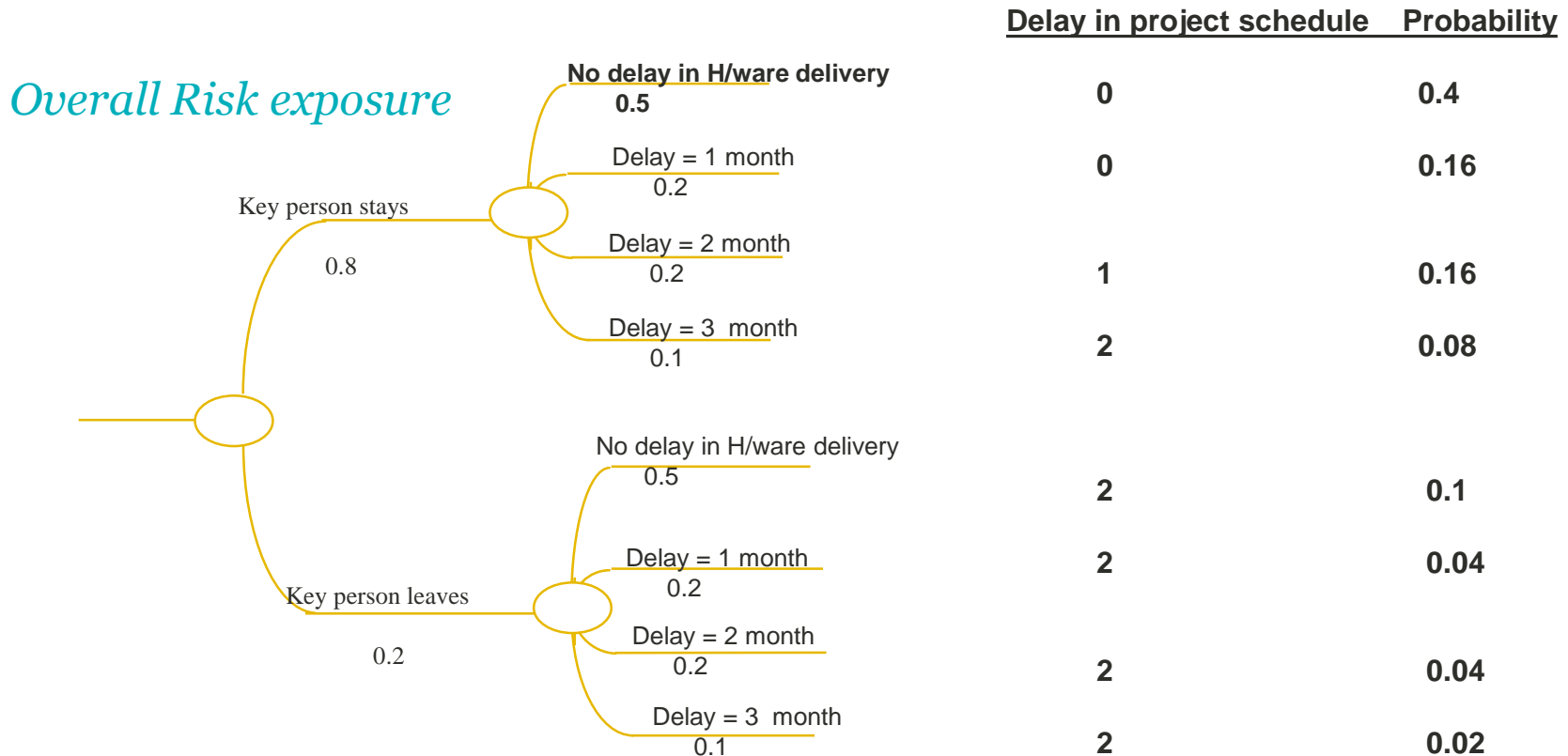
*The probabilities of total project slippage = probabilities of software development slippage*

Probability of slippage of Software dev. of 2 months = Probability of slippage of total project of 2 month = 0.2

*Therefore Risk exposure =  $0.2 \times 10,000 = \$S2,000$*



# EXAMPLE OF OVERALL RISK ASSESSMENT - IV



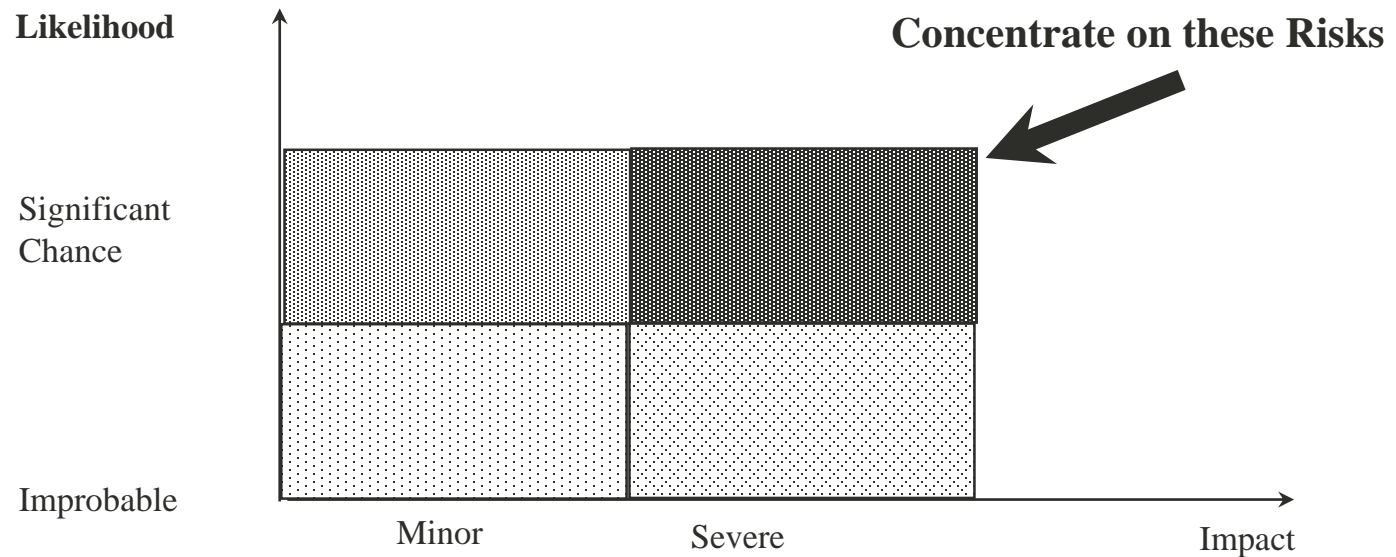
**Total Risk exposure =  $0.16 \times 1000 + (0.08 + 0.1 + 0.04 + 0.04 + 0.02) \times 10,000 = S\$???$**

**Using a Decision Trees Example in Project Risk Management to Calculate Expected Monetary Value**

[http://www.brighthubpm.com/risk-management/48360-using-a-decision-tree-to-calculate-expected-monetary-value/#imgn\\_1](http://www.brighthubpm.com/risk-management/48360-using-a-decision-tree-to-calculate-expected-monetary-value/#imgn_1)

# PRIORITIZING RISKS

*Aim is to write a prioritized list of Risks which will be input to the Risk control process or to management decision-making*



*Remember to re-prioritise after calculating effect of Risk resolution measures*

# PRIORITIZING PROJECT RISKS USING RISK SCORING TECHNIQUES

## Using the (impact, likelihood scores):

*Assign each Risk item to a band*

*Overall priorities by bands*

*Priorities within bands using subjective judgment*

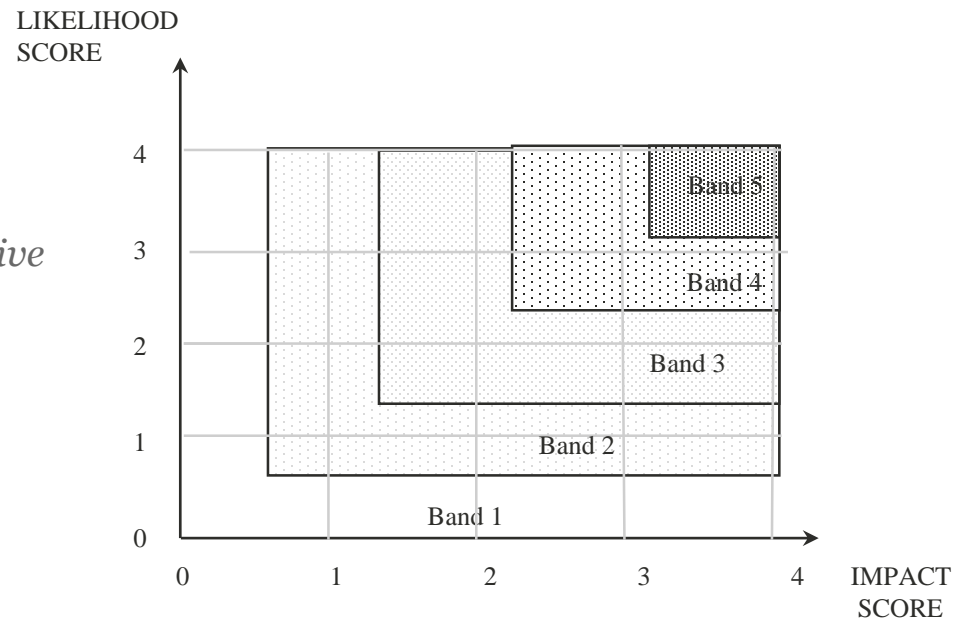
## Can also classify Risks

*Band 1 = No Risk*

*Band 2 = Low Risk*

*Band 3 & 4 = Medium Risk*

*Band 5 = High Risk*



# WORKSHOP I : PROJECT RISK ANALYSIS

*For your projects perform the following Risk analysis*

*Identify at between 4 to 6 Risk items that may occur to your project*

*Determine*

The likelihood of the Risk

The impact of the Risk

*using the scoring scheme on the following pages, produce an impact/likelihood figure (similar to that on previous page), and hence prioritise these Risk items*

# RISK CHECK-BOX LIST

[illegible]

# RISK CHECKBOX QUESTIONS - IMPACT SEVERITY

## 1. Reduced Functionality

*Will this Risk item significantly reduce the original intended functionality of the product, if it occurs*

## 2. Increased Cost

*Will this Risk item have a high impact on the remainder of the project in terms of cost overrun if it occurs ?*

## 3. Schedule Slippage

*Will this Risk item create schedule slippage?*

## 4. Quality Cost

*Will this Risk result in a low quality product which will in turn lead to failure in quality audits, reviews or user acceptance tests?*

## 5. Performance

*Will this Risk result in a low performance product which will not meet users expectations?*

*Further impact criteria can be added if they can be justified*

# RISK CHECKBOX QUESTIONS -LIKELIHOOD

## 1. Novelty

*Does Risk involve new technology or techniques that have not been used before by the project team?*

## 2. Product History

*Has this Risk item occurred in projects where similar products were constructed ?*

## 3. Project Team History

*Did the members of the project team encounter/create this Risk item on previous projects?*

## 4. Recognised Authority

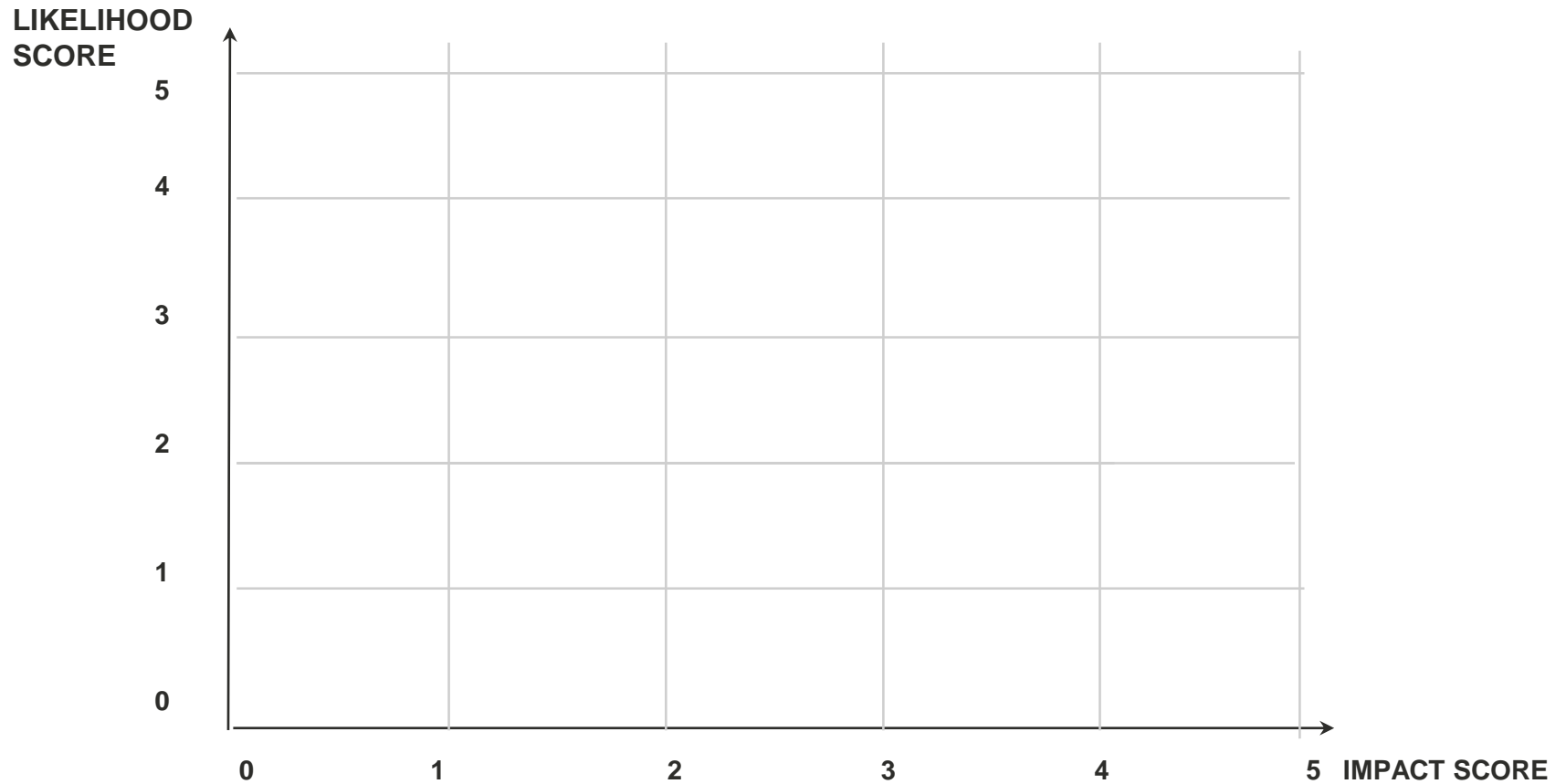
*Does the available specialist advice perceive this to be a likely Risk?*

## 5. Expectation

*Does the current documentation, i.e. product design, project plan suggest a clear and credible idea/plan/model for overcoming this Risk item that has been reviewed and approved? (Score 1 for no, 0 for yes)*

*Risk Management for Software projects ,1994, Down, Coleman& Absolon*

# PRIORITISATION OF PROJECT RISKS





# Risk Control

- 
- + *Risk Planning – What are you going to do about it*
  - + *Risk Resolution – Techniques*
  - + *Risk Monitoring – tracking and re-assessment, re-plan*

# 03

# RISK CONTROL



# RISK RESOLUTION TECHNIQUES

## *Risk Avoidance/Removal*

Avoid creating situations where Risk will occur

Remove those items that are creating Risk

-Change/stabilise requirements

-Change technologies

## *Risk Minimization*

“Divide and Conquer”

Incremental development

-Spiral development

## *Risk Transfer*

Transfer Risk to those organisations/ persons who can control it

## *Risk Localisation*

- i.e. Information gathering

*Prototyping*

## *Risk Insurance*

Contingency planning

# CHOOSING THE RIGHT RISK TECHNIQUES

## *Risk classification*

*Two classes of Risks*

-Uncertainty

-Limits of performance

	Uncertainty	Limits of performance
Risk transfer		X
Risk avoidance/removal		X
Risk minimisation		X
Risk insurance	X	X
Risk localisation	X	
Risk Monitoring	X	

## *Appropriate Risk actions depending on Risk Severity*

### High Risks

Risk avoidance

Risk minimisation

Risk transfer

### Medium Risks

Risk insurance

Risk localisation

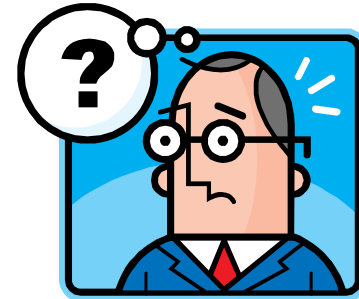
### Low Risks

Risk monitoring

# EXAMPLE OF RISK AVOIDANCE: DEFINING AND STABILIZING USER REQUIREMENTS

*User requirements are often:*

*Incomplete,  
Ambiguous  
Incorrect  
Volatile*



## *Methods that minimise Risk associated with user requirements*

### The “classical” approach

- Thorough rigorous requirements analysis
- Formal user requirements agreement & sign-off
- Change control procedures

### The “prototyping” approach

- Prototype user interfaces (screens) with user features, but no internal processing

# EXAMPLE OF RISK LOCALISATION: PROTOTYPING

## *What prototyping should be used for:*

- *Prototyping User Interfaces*
- *Experimenting with complex algorithms*
- *Determining user requirements by*
  - Studying work interactions
  - Studying work loading
  - Studying user behaviour
- *Investigating throughputs and machine loadings*
- *Investigate what is achievable in the industrial development environment*
- *Investigating what new technology can achieve to support business or project aims*

## *What prototyping is not for:*

- *Demonstrations at exhibitions*
- *Immediately providing a fully operational system*
- *Personal career development/"hobby"*

# EXAMPLE OF RISK LOCALISATION: INCREMENTAL SOFTWARE DEVELOPMENT

## *Produce software in series of releases*

- *Incorporating agreed sets of functionality*

## *Advantages of incremental development*

- *Concentrates on funnelling requirements change into later releases*
- *Maximizes re-use*
- *Early development of limited functionality*
- *You always get something!*

## *Disadvantages of incremental development*

- *User definition of minimum functionality may not match yours - Leading to disagreement between client and developer on prioritisation of requirements*
- *Long development schedule*



# EXAMPLE OF RISK LOCALISATION: BOEHM'S SPIRAL MODEL

*Special case of incremental software development, Produce software in series of prototypes*

## Lifecycle:

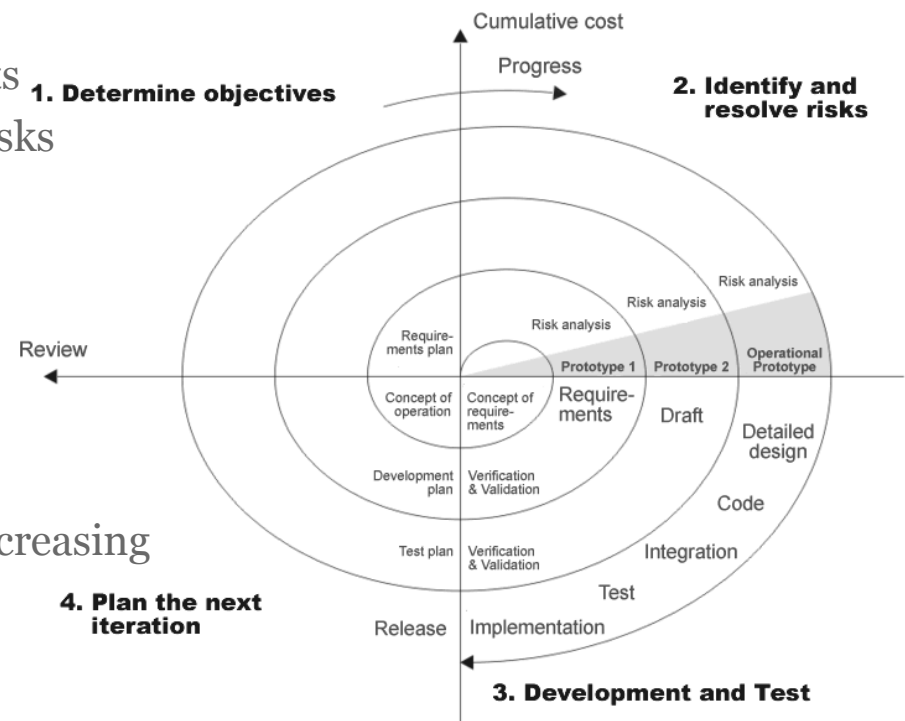
Determine objectives, alternatives, constraints  
Evaluate alternatives, identify and combat Risks  
Develop prototype  
Plan next phase

## Advantages of incremental development

Risk driven not life-cycle driven  
Maximizes re-use  
Rapid development of prototypes provides increasing functionality

## Disadvantages of Spiral Model

Emphasis on prototypes not functional releases  
Long development schedule





# RISK INSURANCE

## Contingencies

### *Two interpretations*



A contingency plan which is activated when certain events occur, or a threshold is exceeded

*E.g. when the effort expended on a task exceeds 80% of the allotted budget, with no visible progress being made on that task*

A contingency factor (usually a %) is added to an original estimate to cater for overspend, unforeseen circumstances, etc... (See project costing lecture)

# RISK ITEM CONTINGENCY PLAN

*Contingency plans are usually associated with individual risk items*

*Contingency plan format:*

- *Risk Item Identification*
- *Impact of Risk*
- *Tracking methods - Including the threshold/activation level*
- *Responsibilities:*
  - Risk tracking*
  - Risk resolution tasks*
- *Risk resolution actions*
- *Resource allocations*
- *Tasks*
- *Constraints*
- *Priorities*
- *Conditions for closure*

# EXAMPLE RISK ITEM CONTINGENCY PLAN

## *Risk Identification:*

*Schedule overrun of > 2 weeks on Requirement specification*

## *Impact of Risk*

*slippage of > 2 weeks in delivery of requirement specification to customer resultant slippage of tasks causes overall slip of > 1 week in Project schedules*

## *Tracking methods*

Gantt charts,

Weekly progress reports

*Threshold level - Reported schedule overrun of >1 week*

## *Responsibilities:*

*Risk tracking : Requirement. spec. team leader*

*Contingency activation : Project manger*

## *Risk resolution actions*

*Authorize overtime as required. for all of analyst team for a period of 2 weeks*

## *Constraints on recovery plan :*

*Recovery effort must not impact parallel tasks*

## *Priorities on recovery actions:*

*(1) Finish User interface specification*

*(2) Finish Database specification*

## *Conditions for closure*

*Formal signed client acceptance of user requirements*

# RISK MANAGEMENT PLANS

*Risk Management can either*

- *Be documented in a project plan*

Include Risk appendix which contains :

- a. Assessment techniques used
- b. A list of prioritised project risks cross referenced to tasks in the plan that will control *or* monitor Risks

- *Be documented in a separate Risk Management plan*

# RISK MONITORING

## *Objectives of Risk monitoring*

*Track Risks which are currently inactive*

*Track for the successful elimination of Risks*

*Monitor for new Risks*

## *Methods of Risk monitoring*

**Can be used for monitoring  
Subcontractors/Vendors**

*Track project progress*

Not only resource consumption but also  
Achievement

*Track progress against Risks*

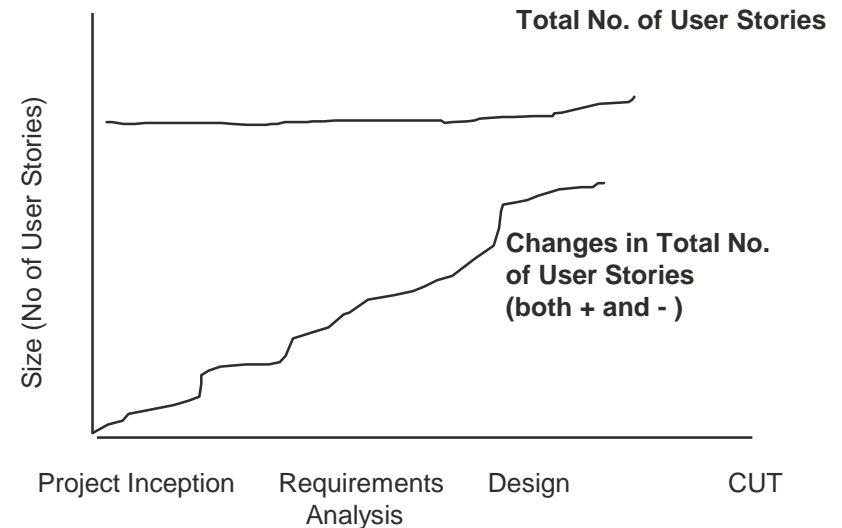
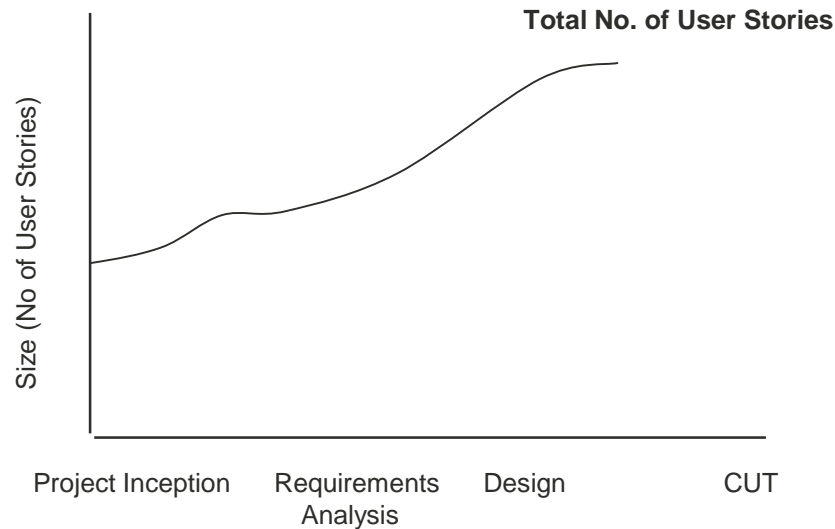
Top-10 Risk items

*Track technical progress for new Risks*

Production of deliverables  
Change in functionality  
Adherence to technical strategy  
Defect tracking

# TRACKING TECHNICAL PROGRESS :

## *Tracking Changes in Functionality using a Size Metric*



- Risk of major changes in functionality created by unclear or volatile requirements
- Measure functionality using Number of User Stories
- Reasons for changes in functionality:
  - Poor understanding of initial requirements
  - High requirements volatility
  - Poor client communications
  - Non-adherence to Project Methodology

# TOP-10 RISK ITEMS TRACKING

*On a regular basis (i.e. each month)*

*Prioritize Risks and Highlight these in*

- monthly progress reports
- monthly project reviews

Position this month	Position last month	Number of months on list	Problem
1	1	3	Skilled staff shortage
2	4	2	Compiler performance
3	2	4	Client acceptance of specifications
4	-	1	Late delivery of Hardware by subcontractor

*Focus on*

- Items that are always there ,i.e. slow progress items
- New entries

# BARRIERS TO RISK APPRECIATION/MANAGEMENT

*Unwillingness to admit risk exists*

*Leaves a negative impression*

*"Success orientation"*

*Tendency to postpone or ignore hard parts*

*Maybe they will go away*

*Maybe they will get easier*

*Culture of “whoever blows whistle on risk owns it”*

*Who should own risks?*

*Risk management costs time and money up-front!*



# SUMMARY

*“Risk is an inherent feature of software development”*

Risk management involves :

- *Identifying, analysing and prioritising risks*
- *Planning, resolving and monitoring risks*
- *Developing a contingency plan for big impact but low probability risks*
- *Incorporating risk management process into the project plan*

**A project methodology and effective risk management will not guarantee project success; but without either, failure is guaranteed”**

# RISK MANAGEMENT REQUIREMENTS FOR PROJECTS

## *Attachments to Project Plans:*

- *Results of Risk checklist*
- *Prioritised list of Risks and the control techniques you intend to employ against them*
- *Identify a Risk monitoring technique you will be using to track Risks*
- *Report Risks as part of your monthly progress reports*

Risk	Control type	Specific Details
Inexperience with new technology...	Risk minimization	Prototyping with new Technology

## WORKSHOP II : PROJECT RISK CONTROL MEASURES

*For each Risk item identified in Workshop I, identify the actions you will be taking to control those Risks (Risk mitigation)*

<i>Risk item</i>	<i>Control type</i>	<i>Specific details</i>